

**INTERACTIVITY AND ELECTRONIC COMMUNICATION:
AN EXPERIMENTAL STUDY OF MEDIATED FEEDBACK**

by

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A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Information)
in The University of Michigan
2008

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For my Grandparents,
who planted the seeds.

ACKNOWLEDGEMENTS

Much of my work grows out of my own belief in the power of interpersonal relationships, and I want to recognize some of the many relationships that made this dissertation possible.

First, I want to thank my committee. My advisor and committee chair, Gary Olson, has provided me with an immense amount of advice and support (as well as a good deal of funding). Given the distributed nature of much of my time as a doctoral candidate, he has been especially willing and adept in the rather ironic role of my electronically mediated source of feedback.

I have left every meeting I've ever had with Michael Cohen with both my mind and heart racing. He has the amazing ability to highlight the thread that connects the day-to-day minutiae of research to the important big questions. Even in my most pessimistic moments, Michael helps me discover the joy and worth in my work.

I first met Judy Olson when I was applying to the masters program at the School of Information, and I've been lucky to work with her in some capacity almost non-stop since I arrived. Serving as both my best example and my most persistent skeptic, Judy is the chief architect of my sense of intellectual rigor.

Jason Owen-Smith has been my guide through the minefields of interdisciplinarity. This dissertation draws on number of research traditions, and Jason

has helped me shape my work to (hopefully) interest and convince multiple audiences. My work is better for Jason's knack for identifying and questioning every assumption.

Several amazing assistants have helped with my dissertation data collection and analysis, including Patrick Dieter, Ryan Foy, Diana Jhin, and Kathy Xie. Jane Dutton, Jane Hassinger, and the Relational Practice Study Group had a deep influence on my conception of and commitment to the study of interpersonal relationships. Thanks to all the staff at the School of Information, especially Christine Eccleston, Dennis Hogan, John Lockard, Sharon Mahoney, Sue Schuon, and Ann Verhey-Henke. My work has been funded by the National Science Foundation, the John D. Evans Foundation, the Interdisciplinary Committee on Organizational Studies (ICOS), the Horace H. Rackham School of Graduate Studies, and the University of Michigan School of Information.

I've been lucky to have had so many amazing friends and colleagues during this process. I particularly want to thank Denise Anthony, Erik Cook, Scott Dennis, Gaby Ford, Kelly Garrett, Mark Handel, Libby Hemphill, Cory Knobel, Cliff Lampe, Fipi Lele, Michelle Bejian Lotia, Ali Assad Lotia, Marsha Naidoo, Jennifer Perkins, Ricky Punzalan, Emilee Rader, Tim Retzloff, Nikhil Sharma, Rick Wash, Kate Williams, Jude Yew, Charles and Kristine Yun, and Ann Zimmerman. Jeremy Birnholtz deserves special mention as an occasional collaborator and constant friend.

It is not possible to adequately express my gratitude to Erik Hofer and Julie Lubeck Hofer. For a significant portion of my doctoral study, I did not live in Ann Arbor, but I made frequent and sometimes lengthy visits. Erik and Julie offered the use of their guest bedroom before I even asked, and let me stay for weeks at a time. They gave me a home away from home and made me feel like I was part of their family.

And finally, I must thank my own family. My parents have patiently supported and encouraged me through many more years of education than I'm sure they could have expected. Even though we haven't lived in the same town for many years, my sister Melanie is still one of my best friends. And I am forever grateful to Daniel Rogalski, for making me very happy.

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ABSTRACT

Interpersonal critical feedback is a particularly important form of organizational communication. With the rise of distributed work practices, virtual teams, and other non-collocated forms of work, feedback must increasingly be communicated through electronic means. Electronic communication media can reduce and distort contextual information, affect the interpretation of social cues, and shape relationships among communicators. This dissertation develops a theory of communication interactivity and presents two experimental studies designed to understand how the interactivity of a communication environment affects the delivery and interpretation of critical feedback.

In both experiments a participant received critical feedback about a document (s)he had written. The feedback was delivered in one of four mediated communication conditions. In two conditions, both the feedback provider and feedback recipient used the same communication medium, either videoconferencing or instant messaging. The other two conditions used mixed-media environments in which one participant sent messages through videoconferencing while the other replied using instant messaging. The first experiment examined how the communication environment affected both the critic and the feedback recipient, with experimental subjects in both roles. The second experiment focused only on the recipient's reaction to criticism, so that uniform feedback was delivered to all participants by a confederate.

The results of these experiments suggest that feedback delivery, interpretation, and use are affected by the communication environment. When feedback was delivered in videoconferencing instead of instant messaging, recipients found it less negative, formed better impressions of the critic, and believed the feedback more. Recipients were more likely to incorporate the critic's suggestions into their document when the critic was sending feedback through videoconferencing, and when the recipient was able to reply in videoconferencing. There is some evidence that men and women react to communication media differently in the feedback process. The experiments provide limited support for the theory of interactivity in electronically mediated communication developed here.

CHAPTER 1

INTRODUCTION

Interpersonal communication is key to organizational life. Increasingly, this communication is taking place in electronically mediated contexts. Knowing how these technologies affect the process and outcomes of communication is crucial for understanding, designing, and managing virtual teams and other forms of distributed work.

Interpersonal critical feedback is a particularly important form of organizational communication. Receiving feedback can improve performance and enhance self-awareness. Critiques of performance or products provides guidance about where quality improvements need to be made. Praise can indicate the areas that either do not require improvement or can serve as models for future work. Beyond these task-related functions, feedback also helps individuals maintain an accurate self-image. Employees who know what their colleagues think of them are able to act appropriately and won't be surprised by feedback when it does come (Ashford, Blatt, & VandeWalle, 2003; Ilgen, Fisher, & Taylor, 1979).

Feedback can also create and enact social structure. For example, Owen-Smith (2001) finds that the patterns of expressed skepticism—who gives feedback to whom—in a scientific laboratory are determined by social and organizational status. Others have

also found that both the way feedback is given and the reactions to feedback are determined by status and power (Carson & Cupach, 2000; Fodor, 1974; Fournier, Moskowitz, & Zuroff, 2002).

At root, however, the purpose of most critical feedback is to reinforce or change a person's behaviors. As such, much of the research on feedback processes has been focused on those factors that determine whether feedback successfully produces the intended response (Ilgen et al., 1979). It has been shown that the response to feedback is determined by characteristics of the message itself, characteristics of the feedback source, and characteristics of the recipient (Anderson & Jones, 2000; Baron, 1988; Chamberlain & Haaga, 2001; Giffin, 1967; Hickey, 2001; Hoxworth, 1989; Jacobs, Jacobs, Feldman, & Cavior, 1973; Podsakoff & Farh, 1989; Shao, 1997). The impact and specific effects of these factors also tend to vary across cultures (Stone-Romero & Stone, 2002).

One of the reasons feedback is such a fertile research area is because it is a rich communication task. Of course, one goal is to make sure that information is transmitted and understood accurately, but feedback information can include both technical details about the object at hand and subtle descriptions of emotional reactions. Feedback conversations usually have clear roles, with one person (or group) giving feedback and another receiving it. Giving feedback often means delivering bad news, which can be particularly difficult (Bond & Anderson, 1987). The feedback recipient must be persuaded that the critic's subjective evaluation is accurate and relevant, which is especially challenging if the evaluation is inconsistent with other people's or the recipient's own evaluation. This communication often takes place within a context of particular interpersonal relationships as well as political and organizational factors. Given

the importance and challenges of feedback communication, it is somewhat surprising that very few studies have focused on electronically mediated feedback (Hebert & Vorauer, 2003, is a notable exception).

Research on computer-mediated communication (CMC) has grown to be increasingly important as mediating technologies have become more common and varied (Olson & Olson, 2000). Various streams of research have looked at effects of mediated communication at the organizational, group, and interpersonal levels. One stream of research (including some of the earliest CMC literature) concentrates on how the use of these channels affected group processes like cohesion, decision making, and status (Bos et al., 2006; Bos, Shami, Olson, Cheshin, & Nan, 2004; Dubrovsky, Kiesler, & Sethna, 1991; Kiesler, Siegel, & McGuire, 1984; Siegel, Dubrovsky, Kiesler, & McGuire, 1986; Sproull & Kiesler, 1991). Others have focused on the organizational implications of networked communication technologies (Jarvenpaa & Leidner, 1999; Mortensen & Hinds, 2002; O'Mahony & Barley, 1999; Walsh & Bayma, 1996; Walsh & Maloney, 2002). Another thread of research looks at the micro-processes of interpersonal interaction in mediated environments (Gergle, Rose, & Kraut, 2007; Horn, 2001; Huang, Olson, & Olson, 2002; Kraut, Gergle, & Fussell, 2002; Veinott, Olson, Olson, & Fu, 1999; Zheng, Veinott, Bos, Olson, & Olson, 2002). The current study continues in this last tradition.

Many studies of technologically mediated communication compare one or two “mediated” communication channels to face-to-face communication. Especially when looking at the differences between co-located and distributed organizations, this high-level approach produces useful results. However, lumping all electronically mediated

communication into a single category hides the micro-processes that, for example, make the experience of communicating by e-mail very different from that of having a video-conference. Similarly, by treating “face-to-face” as a unitary category, we miss the subtle variations in physical space and designed environments that might affect how we interact.

Not every CMC approach sees a strict dichotomy between mediated and face-to-face communication. For example, we can think about the impact of CMC on interpersonal communication using the lens of “media richness” (Daft & Lengel, 1986; Kahai & Cooper, 2003). Some media allow for greater information flows than others. Face-to-face communication is a very information-rich environment, while the telephone, which preserves vocal inflection as well as the text is less rich, and e-mail, which relies solely on the text to carry meaning is a particularly “lean” medium. Or we can take a less linear approach, where each communication medium has particular features that constrain the possibilities for conversation (Clark & Brennan, 1991; Kraut, Fussell, Brennan, & Siegel, 2002). For example, while e-mail lacks audibility and visibility, it has the properties of reviewability and revisability.

The studies presented here focus on a particular property of communication environments that is hypothesized to be important for feedback communication: *interactivity*. Interactivity is used here to refer to the ability of a communication environment to support interlocked and contingent action. Communication in which participants respond to each others’ statements and craft their responses in light of what has already been said is crucial for sensemaking (Weick, 1979; 1995). It is only through this kind of interaction that communicators signal their comprehension to each other (Clark & Brennan, 1991). While media richness theory focuses on the ability of a

particular channel to carry a specific kind of information, interactivity focuses on the ability of an environment to support sensemaking processes.

Two studies were conducted to examine how feedback communication processes are affected by the interactivity of the communication environment. Both studies share the same basic framework. One subject is assigned to the role of “Writer,” and is asked to create a document based on a business case study. Then a “Critic” gives the Writer feedback about how to improve the document. The feedback is delivered in one of four electronically-mediated communication environments. After receiving feedback, the Writer edits the document before submitting a final version. Data are generated from questionnaires, transcripts of the feedback conversation, and the documents that the Writers create.

A key innovation in these experiments is the use of both same-medium and mixed-media communication environments for the feedback conversation. Participants communicate using either instant messaging (IM) or videoconferencing (VC). In the two same-medium conditions, both the Critic and Writer are using instant messaging, or both are using videoconferencing. In the two mixed-media conditions, one subject sends messages through instant messaging, while the other sends messages in videoconferencing. By looking at the data in a 2x2 ANOVA (Critic’s medium by Writer’s medium), we can distinguish effects resulting from the carrying capacity of a particular medium from the interactivity effects on the communication process.

The first study looks at both the Writer’s and Critic’s response to the variations in the communication medium. It is hypothesized that the changes in communication environment will affect both the way that the Critic delivers feedback, and the way that

Writers respond to the feedback they receive. The second experiment focuses only on the Writer's response to feedback, and uses a confederate in the Critic's role.

As more organizations operate in distributed environment, using virtual teams supported by networked communication technologies, it becomes even more important to understanding how these technologies affect communication. Delivering critical feedback is an important organizational interaction, and is particularly sensitive to variations in content, style, and interpersonal relationships. This study will increase our knowledge about how mediated communication environments affect feedback communication, and develop and test a theory of communication interactivity.

The next chapter reviews the literature in the areas of feedback delivery and computer-mediated communication. The following two chapters present the results of two experiments designed to test the effects of interactivity on feedback processes. The final chapter discusses these results, addresses the limitations of this study, and suggests directions for future research.

CHAPTER 2

LITERATURE REVIEW

Interpersonal Critical Feedback

In the broadest sense, feedback occurs when the output of a system is “fed back” into the system that generated those actions, and becomes the basis for new output. The current study will use a much narrower definition of feedback, but one that maintains its ties to this general meaning. The level of analysis here is the individual in a social situation, especially a team or work group within an organization. And the focus is on a particular subset of feedback: interpersonal critical feedback. We are interested in those situations in which an individual evaluates the work of another, and provides critical commentary.

A clear implication of this characterization is that individuals take on distinct roles in a feedback interaction. Namely, some people are *giving* feedback, while others are *receiving* it. The feedback information flows in one direction. There are exceptions, of course. Sometimes people will give feedback to each other, but these situations can usually be decomposed into separate instances of directional feedback. It is also possible to give self-directed feedback (imagine editing an older document, or filling out a self-evaluation form), but these studies focuses only on *interpersonal* feedback.

Giving and receiving critical feedback is a familiar process in a number of situations. Teachers regularly grade and comment on students' assignments. Academics evaluate and comment on each others' work in the journal and grant review process. Formal and informal critiques are a common feature of studio environments like architecture or industrial design. Many organizations require regular performance reviews in which a supervisor comments on their subordinates' performance.

In some circumstances, the purpose of interpersonal feedback in the workplace may be something other than evaluation. Supervisors may give good feedback in order to boost the morale of their subordinates. If feedback is given in public, its purpose may be to influence others' perception rather than to provide an honest evaluation. Someone may give good or bad feedback based on their own feelings toward a person rather than their reaction to that person's work.

Social structure can also influence what feedback is given. For example, Owen-Smith (2001) finds that the patterns of expressed skepticism—who gives feedback to whom—in a scientific laboratory are determined by social and organizational status. Feedback almost always flows from higher-status to lower-status individuals. Others have also found that both the way feedback is given and the reactions to feedback are determined by status and power (Carson & Cupach, 2000; Fodor, 1974; Fournier et al., 2002).

Given all of this, it should not be surprising that giving effective criticism may be a difficult process. It seems improbable that McGuire's conditions for giving convincing feedback are ever fully met:

To change people by presenting convincing feedback is to be concerned with explicitness, immediacy, accuracy, and relevance and to have

material presented by an expert source as an issue of fact rather than an issue of taste, dispassionately, and on an issue where the target person has no preconceptions. (McGuire, 1968 as cited in Weick, 2001, p. 400)

The exact nature of feedback can be difficult to pin down, and multiple interpretations of feedback are often possible. Given this equivocality, feedback is often an occasion for sensemaking (Weick, 2001).

It is important to note that much of the information needed to interpret feedback is not in the content of the feedback itself. Interpreting feedback requires a large amount of contextual information, including but not limited to the style in which the feedback was delivered, the past and expected future relationship between the source and recipient, who else was present to hear the exchange, where the feedback was delivered, and even the mood of the participants at the time (Ilgen et al., 1979).

Conflict has been studied extensively in recent literature about virtual teams, and there are several parallels between conflict and feedback (for example, Mannix, Griffith, & Neale, 2002; Mortensen & Hinds, 2001). Both conflict and feedback have task and affective dimensions, although this distinction has been studied more in the conflict than the feedback literature. Additionally, both conflict and feedback can produce constructive or destructive group and organizational outcomes (Baron, 1990; Jehn, 1995). Feedback and conflict also interact in daily organizational life. Conflict can be born out of criticism or poorly delivered feedback (Baron, 1988). Likewise, in situations of high conflict, feedback processes will suffer. Disagreements about process or content may inhibit the ability to give effective feedback.

Feedback and conflict have certain similarities and interactions, but it is important to recognize that they are two distinct processes. Whereas feedback can be positive and express agreement, conflict implies the existence of value disagreements or

incompatibilities between individuals (Boulding, 1963; Deutsch, 1973; Jehn, 1997).

Additionally, whereas it is possible to have unexpressed conflict, feedback is at base an information exchange through interpersonal interaction.

Effective Feedback

Organizations are concerned with the effectiveness of feedback processes.

Receiving feedback from supervisors and colleagues helps employees regulate their own behavior, set appropriate goals, and recognize how they fit into the organization.

Processes like “360 Degree Feedback” recognize that feedback need not only flow down a hierarchy, and provide tools for staff members to provide feedback to their managers (Atwater & Brett, 2006). Both formal and informal feedback have their place in organizations, and serve these functions in somewhat different ways. Formal feedback can be quite explicit and developed, while informal feedback can be more frequent and often from a wider variety of sources. But feedback for feedback’s sake is not sufficient. It is important to ask if the criticisms are constructive, if the praise is motivational, and if the suggestions are followed.

When feedback is effective, there are a number of organizational benefits that may accrue. Task feedback can help improve product quality (Longenecker, Scazzero, & Stansfield, 1994). Being receptive to criticism can improve learning in the organization (Bligh & Slade, 1996). Feedback can help build self-awareness and interpersonal skills among employees (Ashford et al., 2003). But when feedback goes wrong, the consequences can be particularly damaging. Feedback can be destructive if it is inconsiderate, poorly communicated, non-specific, or personally judgmental. It can cause anger and tension between co-workers, and may also negatively impact how employees

handle future disagreements (Baron, 1988), leading to avoidance and unwillingness to compromise.

The impact of criticism can not be predicted directly by the content of the message. For example, Meyer (1979; 1992) found that praise and criticism can have paradoxical effects. While praise from a superior can often be used as a reward for good performance, recipients may also interpret praise to suggest that the supervisor's expectations were low. Likewise, when criticism is too harsh, recipients may reject it because they perceive that the source's expectations were too high. As a result, feedback that was meant to reinforce or sanction particular behavior may instead have adverse effects on motivation. This suggests that feedback failures can stem not only from misunderstanding the feedback itself, but also from misinterpreting the source's intent or expectations.

The efficacy of feedback is judged by the impact it has on the recipient. This involves both whether the feedback has any impact at all, and if it does, how it affects the recipient's future actions. For example, recipients of negative feedback may ignore the feedback (no impact), or they may choose to work harder in the future or to lower their aspirations (Nease, Mudgett, & Quinones, 1999). In the study presented here, the feedback messages are intended to produce a particular change in the content of a document. As such, feedback success will be determined by the extent to which the feedback recipient follows the suggestions from the critic.

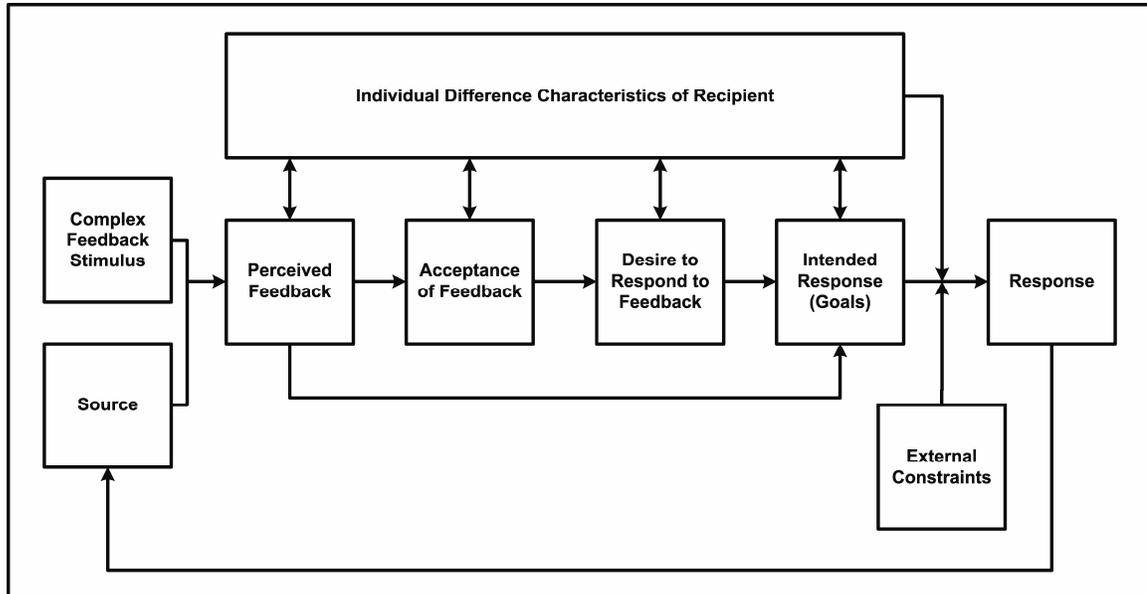


Figure 1: Model of the effects of feedback on recipients, from Ilgen, et al., 1979.

Ilgen et al. (1979) developed a cognitive model of the effects of feedback on recipients (see Figure 1). They see feedback as a complex stimulus that comes from a source and acts on a recipient. Once the stimulus has occurred, there are several steps before a response is produced. First, the recipient must recognize the stimulus as feedback, and interpret its meaning. Second, the recipient accepts or rejects the feedback based on the recipient’s belief that the feedback accurately reflects his or her performance. Then, if the recipient develops a desire to respond to the feedback, he or she cultivates an intended response, and then responds.

Feedback acceptance marks a crucial point in the feedback process. Here, I will refer to feedback acceptance as a decision point, but this is not meant to imply that feedback acceptance is necessarily conscious or deliberate. Additionally, feedback acceptance is not necessarily binary. Feedback can be wholly accepted or wholly rejected, or recipients may decide to take the feedback “with a grain of salt.” We should also note that just because feedback is accepted doesn’t necessarily mean that it is

effective. Feedback acceptance, however, is a prerequisite for an effective feedback process.

At each stage of the process, the effects are determined by characteristics of the source of the feedback, characteristics of the feedback stimulus itself (the message), and characteristics of the recipient. Especially because the present concern is primarily with the recipient's response to interpersonal feedback, it is important to note that what Ilgen, et al. call the "characteristics of the source" can often be more accurately described as characteristics of the *relationship* between the source and the recipient.

This brings us to an important point about the current study of feedback acceptance. The decision about whether to pay heed to feedback rests upon the *perceptions* and *beliefs* of the recipient. These perceptions and beliefs are colored by characteristics of the relationship between the source and the recipient. For example, Ilgen et al. (1979) suggest that the source's power over the recipient is important in determining feedback acceptance. However, if the recipient does not know that the feedback is coming from a powerful person, or the recipient does not respect the source's power, then this factor will not influence the acceptance decision.

In this study, I propose to consider another influencing factor beyond Ilgen et al.'s model: the communication medium. Their model (like much of the feedback literature) is focused on how individual difference characteristics of the recipient affect the feedback process. However, CMC research suggests the possibility that the communication medium may affect what feedback is given, how the feedback and the source of the feedback are perceived, and the power of the feedback to influence future actions.

Mediated Interpersonal Communication

By now, we should not be surprised by the interplay of medium and message (McLuhan, 1964). Research interested in understanding media effects in the arena of interpersonal communication began to grow as the variety of communication technologies increased. Just a few decades ago, most text messages were sent by postal mail, we could use the telephone for voice messages, and moving pictures were essentially unavailable as an interpersonal communication medium. In today's work environment, however, e-mail, conference calling, instant messaging, web conferencing, videoconferencing, and many other technologies are commonplace.

A number of theories have been put forward to suggest how these technologies affect interpersonal communication. In the next section, I will outline some of these theories and their implications for feedback communication. I will then propose an extension to affordance theory that takes into account the level of *interactivity* supported by the communication environment.

Throughout this document, I will use the convention that a communication *medium* refers to any particular communication technology (e.g. instant messaging, e-mail, or face-to-face). On the other hand, a communication *environment* refers to a communication medium or mediums in the context of use. Thus, a conversation taking place with one individual speaking over the phone while another person types replies results in a mixed-media communication environment.

Theories

Many theories about electronic communication focus on how interacting in these media (especially e-mail and other text-based communication) is different from face-to-face (FtF) communication. In an early study of corporate electronic mail use, Sproull and Kiesler found that the lack of social context cues in e-mail led to less social inhibition and an increase in “flaming” and other destructive behaviors (1991). They also found, however, that e-mail complemented FtF communication, in that new information was sent in e-mail that wouldn’t have been shared in FtF settings.

Media richness theory focuses on the ability of a communication medium to reduce equivocality (Daft & Lengel, 1986). Equivocality is marked by ambiguity, confusion, and the existence of multiple or conflicting interpretations. Media richness theory suggests that media that allow more immediate feedback, greater personalization and variety of messages, and support a larger number of cues and channels (like non-verbal cues) are better suited for tasks with high equivocality. On the other hand, lean media may be more appropriate for tasks with low equivocality.

While media richness theory has engendered a great deal of interest, empirical studies have produced in mixed results (Kahai & Cooper, 2003). Most early studies of media richness suggested that there was a universal rank-ordering of media richness, with textual communication on the lean end of the spectrum, and face-to-face the richest medium. However, more recent studies have shown greater support for media richness theory by taking a more dynamic and complex approach to richness. Channel expansion theory, for example, suggests that as individuals gain experience with a particular communication medium, they will perceive it as being richer (Carlson & Zmud, 1999).

The perceived richness of a medium turns out to be a better predictor of media choice and use than a static ranking of technologies.

Another set of theories that try to explain CMC effects are focused on individual and group identity. For example, the social identification model of deindividuation effects (SIDE), like Sproull & Kiesler (1991), suggests that computer-mediated communication tends to make personal identity less visible, and as a result, can reduce social pressures. However, SIDE goes further and suggests that depersonalization in CMC also has effects on how individuals perceive others. Without individualizing cues, people are more likely to identify others through social group or category cues rather than as idiosyncratic individuals (Postmes, Spears, & Lea, 1998; 2000; 2002; Spears, Lea, & Lee, 1990; Spears, Postmes, Lea, & Watt, 2001). As a result, they claim that CMC leads to greater stereotyping and divergence in attitudes and opinions. Even though these studies experiment with specific technologies (for example, Internet Relay Chat), results tend to be (over-)generalized to all CMC technologies.

Taken together, the group of theories that focus on social presence, the lack of social context cues, or media richness has been termed the “cues-filtered-out” approach (Culnan & Markus, 1987; Walther & Burgoon, 1992). Walther specifically notes that these theories have not been able to account for the conflicting results from laboratory studies and field studies of media effects. He criticizes these theories for implying that media effects are “inherent, constant, and context invariant” (Walther, 1992). Walther suggests that instead, laboratory findings apply only at a particular “boundary condition” where the participants do not know each other. His social information processing perspective suggests that computer-mediated communication affects not the amount of

social information that is communicated but instead the rate at which it is communicated (Walther, 1996). He predicts that the quality of interpersonal relationships will not vary between mediated and face-to-face conditions once the participants have gotten to know each other.

Walther's focus on temporal issues highlights the notion that our communication needs change over time. For example, social context cues may be filtered out in electronically mediated communication, but if we already know the person we are working with, and we have spent time with them in their environment, our need for social context cues will be less than it was at the beginning of our relationship. Similarly, social presence may be constrained in mediated communication, but communication partners are likely to adapt to the medium and learn strategies for communicating social presence when necessary (e.g. through emoticons or by making emotional cues explicit rather than tacit).

This suggests that predicting media effects requires three inputs: the communication needs (as determined by the type of communication and the context in which it takes place), the way that the medium constrains the communication, and the strategies that are available for meeting (or changing) the needs given the current constraints (Birnholtz, Finholt, Horn, & Bae, 2005). To give an example, imagine that two individuals are negotiating the purchase of widgets over the telephone. In this interaction, it is important that both parties believe that the other is able to fulfill his end of the bargain (either by supplying the widgets, or paying for them). Several studies have shown that the use of electronically mediated communication can impair trust formation. However, if this is the twentieth order for widgets that these two people have negotiated,

Table 1: Affordances of communication media. From Kraut, et al. (2002). Adapted from Clark and Brennan (1991).

| Affordance | Definition |
|-------------------|--|
| Audibility | Participants hear other people and sounds in the environment. |
| Visibility | Participants see other people and objects in the environment. |
| Tangibility | Participants can touch other people and objects in the environment. |
| Copresence | Participants are mutually aware that they share a physical environment. |
| Mobility | People can move around in a shared environment. |
| Cotemporality | Participants are present at the same time |
| Simultaneity | Participants can send and receive messages at the same time. |
| Sequentiality | Participants take turns, and one turn's relevance to another is signaled by adjacency. |
| Reviewability | Messages do not fade over time but can be reviewed. |
| Revisability | Messages can be revised before being sent. |

there is a significant amount of trust already in place. The parties will adopt the strategy of signing a contract for the sale, which may also reduce the need for trust. Even though the situation and contract strategy have minimized the need for trust in this interaction, the participants may also adopt a strategy of engaging in personal chit-chat before getting down to business to reinforce their already-established relationship (Zheng, Bos, Olson, & Olson, 2001). Communicating successfully relies not only on the medium, but also on the needs of the participants and the strategies that they employ.

Clark & Brennan (1991) and Kraut, Fussell et al. (2002) both adopt an approach that focuses on the interactions between conversational needs and the properties of the communication technology. Clark and Brennan outline the “constraints” that technologies place on communication processes. Kraut, et al. adopt the language of “affordances” to describe a technology’s support for particular communicative goals (Gibson, 1966; Norman, 1988). For example, while e-mail lacks audibility and visibility, it has the properties of reviewability and revisability (see Table 1).

The choice of communication channel may be more complex than simply using the richest medium available (Rasters, Vissers, & Dankbaar, 2002). Instead, individuals

may choose the medium that provides the best set of affordances for the particular conversation, and in fact, technology has the potential to provide a “beyond being there” experience (Hollan & Stornetta, 1992; Olson & Olson, 2000). This suggests that a technologically mediated conversation is not necessarily a degradation of the face-to-face experience. Rather, the success of the mediated communication may depend more on the fit between specific communication needs and media affordances (Birnholtz & Horn, 2004).

Most authors who study affordances in CMC, however, focus on one particular element of successful conversation: grounding. Grounding refers to the coordination process by which partners in a conversation achieve shared understanding. While developing common ground is necessary, it is not the only criteria for successful conversation. In this study, I will examine how technologies constrain and afford a different and more specific conversational purpose: feedback delivery and receipt.

Mapping affordances is a useful way to think about how particular technologies shape communication, even if the concept has been overused, and used sloppily, in the HCI literature (Baerentsen & Trettvik, 2002). We can gain more precision by characterizing affordances in terms of the cost structure of communication within a particular communication environment. While I do not intend to create an elaborate economic model, there are some assumptions that need to be stated:

- Communication is functional, but not necessarily in a clear or explicit way. The most obvious, but surely not the only, function of communication is to convey information. Communication may also serve social, emotional, or psychological purposes (among others). A single conversation may serve multiple purposes.

- As such, conversations will vary in their degree of success, defined as the extent to which the purposes of the conversation are met.
- People do not want to expend more effort than is necessary to achieve their communicative goals. In other words, they will follow the principle of *least collaborative effort*: “In conversation, the participants try to minimize their collaborative effort—the work that both do from the initiation of each contribution to its mutual acceptance” (Clark & Wilkes-Gibbs, 1986). Clark and Brennan are concerned with the effort to achieve common ground in a conversation, but this principle will also apply to other communication goals.
- Costs are to be understood broadly in terms of the effort required to meet a communication need. Costs inhere not in the communication medium alone, but, like affordances, in the interaction between the environment (medium) and behavior (action) (Gibson, 1986). In other words, we should speak not simply of the cost of video-conferencing, but rather of the cost of, for example, signaling agreement in video-conferencing.
- Changes to the cost structure of communication will result in changes in the effort required for successful communication. For example, if it becomes more difficult to satisfy the communication needs (cost goes up), then the participants will either need to work harder, or will have a less successful conversation.
- Any particular change in the cost structure of communication (for example, changing the medium, or the strategies used) will not necessarily affect all communication processes equally. For example,

switching from audio to text conversation may make it easier to convey technical specifications, even as it makes trust-building more difficult. Given that conversations may have multiple purposes, a change in cost structure may have both positive and negative effects on the conversation.

- Two processes will affect this equation over time. First, communication needs may change. For example, individuals who have an established relationship will not need as much introductory conversation. Second, the costs may change over time as participants learn to communicate in a given situation or adopt more efficient strategies (adaptation). For example, the use of various abbreviations and “emoticons” in Instant Messaging make communication of emotions and agreement less costly.

It is important to understand both the costs and benefits of a particular communication environment, especially if we are interested in how communicators choose their communication technologies. For example, non-native speakers may find that text-based environments provide important benefits, including the ability to re-read and edit messages before sending (Veinott et al., 1999). And while videoconferences can provide non-verbal cues and rich channels, technical discussions may benefit from having a text-based medium in which to send data or complex instructions. However, because this study is interested in the impact of a particular communication environment on the ability of communicators to have a successful conversation, the discussion here will focus mostly on communication costs.

This framework suggests that to understand how various media affect the cost structure of communication, it is necessary to understand the purpose of the communication (and attendant success criteria), the features of the communication environment (media), and the strategies available within that environment.

Applying the Framework

In this section, I will outline the components discussed above as they relate to communicating feedback under varying conditions of interactivity.

Purpose: Communicating Feedback

Feedback may serve many purposes in organizations, including helping someone improve their work, making a political move, or creating a psychological impact in the recipient. For the most part, this study will be concerned with the persuasive function of feedback: does the feedback induce a response in the intended direction. In other words, if the critic suggests a particular change, does the recipient make that change?

The emotional and relational purposes of feedback will not be ignored, but will be approached from the standpoint of the feedback recipients' perceptions. The studies presented here are designed so that we can expect that critic's only goal is to provide feedback that will help improve the quality of the feedback recipient's work. We may find, however, that in some conditions, recipients are more or less likely to perceive other motives. If the recipient ascribes political or other motives to the critic, this will be treated as a failure in feedback communication.

Communication Environment: Interactivity

This dissertation focuses on the effects of one particular characteristic of feedback communication: interactivity. The term interactivity has been given a wide variety of meanings in reference to computers and communication, especially to designate interfaces that respond to human input (e.g. “interactive web sites,” or “large interactive displays”). I will use it in a more restrictive fashion to refer to communication environments that allow and perhaps encourage interactive communication behaviors.

Communication environments support interactivity when they allow for interlocked and contingent action, in the sense that Weick speaks of the process of organization:

Processes contain individual behaviors that are interlocked among two or more people. The behaviors of one person are contingent on the behaviors of another person(s), and these contingencies are called *interacts*. The unit of analysis in organizing is contingent response patterns, patterns in which an action by actor *A* evokes a specific response in actor *B* (so far this is an interact), which is then responded to by actor *A* (this complete sequence is a *double interact*). (Weick, 1979, p. 89)

While it is not necessary that there be rich and full communication to enact these contingencies (Rabinowitz, Kelley, & Rosenblatt, 1966), there must be some way of signaling responses between *A* and *B*. It is my contention in this study, however, that various media impose different costs on this signaling, and that the communication environment will affect both organizational processes and outcomes.

There are three primary ways that media impact interactivity. First, signaling may incur different costs in different media. For example, typing a response may require more effort than saying it. Second, the media may limit the ability of both partners to participate equally in the communication. Can both signal their responses, and are the signals sent in the same way (and with the same effort)? Finally, various media may

impact the speed with which the signals can be sent and received. For example, typing a message often takes longer than speaking the same message. Some media, like e-mail or written letters, tend to have delays between the time a message is sent and when it is received. While long delays do not make it impossible to develop interactivity, they can make it more difficult. For example, the limitations of human memory may make it difficult to build shared history and maintain common ground. During transmission delays, it is also possible that the context for the discussion may change, so that a message may no longer be relevant by the time it is received. The current study only looks at media in which the sending and receiving of messages is nearly instantaneous, but the impact of transmission delay on interactivity deserves attention.

Some media (like video or audio conferencing) also allow very quick non-verbal communication, sometimes referred to as *back-channel communication*. Back-channel communication is that in which the recipient of a message can signal comprehension (or lack thereof) to the sender while the message is being sent (Krauss & Fussell, 1991; Yngve, 1970). More recently, some authors have used the term “backchannel” to indicate a secondary conversation channels in group situations that allow a separate conversation to take place (often compared to students passing notes in a classroom) (McCarthy et al., 2004). This second meaning will not be used here.

It is important to remember that interactivity is a property of an enacted communication environment rather than being a property of the medium. Other factors may impact interactivity, such as the personalities of the people involved and their relationships with each other. A corollary is that any particular medium may not always produce the same level of interactivity, especially as context or level of experience

changes. However, media do have consistent communication costs, and given a particular set of communication goals and knowledge of the communicators and their experience with the media, we can predict the interactivity of the communication environment.

Interactivity plays an important role in helping participants in a conversation create shared meaning. For each contribution to a conversation, grounding requires that the participants mutually believe that they understand what the contributor meant (Clark & Brennan, 1991). Reduced interactivity in a conversation will make it more difficult for the participants to meet this grounding criterion. It will make it more difficult for the listener to give signals that she understands, or ask for clarification when she does not.

Even when both the feedback provider and recipient understand the meaning of each individual utterance, the lack of interactivity can still present challenges to higher-level comprehension in the conversation. The lack of interactivity makes it more difficult for the feedback recipient to ask questions or challenge the provider on the feedback that is given. Feedback is more likely to be accepted if it is accompanied by an explanation of the specific issue and the rationale. However, with reduced interactivity, the provider may have difficulty judging when enough evidence has been given to support their judgments.

In most face-to-face situations, especially among dyads or small groups, interactivity can be assumed to be fully supported. But it can be useful to imagine some face-to-face situations in which it is not. Consider, for example, a large lecture hall where there is one primary speaker and a large audience. While the speaker is able to get some cues from the audience (are they sleeping?), these are relatively low fidelity and generalized across a large number of people. And if there is a strong spotlight on the

speaker, and the audience lights have been dimmed, it can seem to the speaker as if she is addressing the void. This is not to say that these problems prevent successful communication. A good lecturer will develop strategies to help overcome the limitations of or change the features of the space. Good speakers may circulate through the aisles to have closer contact with audience members. Or may simply ask that the lighting be changed. However, these strategies take time and effort to develop.

Architecture is not the only cause of these effects. Real or perceived status differentials among communicators or situational norms may produce a similar effect. Someone who is being addressed by a judge or yelled at by their boss may remain silent or feign understanding out of fear rather than true comprehension.

Electronically mediated communication channels can also affect interactivity. Many conference phones and voice-over-IP applications are “half-duplex”—only one participant may speak at a time. Noise-reduction and data-compression technologies may mute softer sounds or reduce sounds in certain pitch ranges. Even if a phone supports full duplex, in many conference calls one party will mute their audio to improve the quality of audio from the other site.

Centra software provides an appropriate example of how a technology can affect the costs of interactivity (Centra Software, 2004). Centra is a suite of real-time collaboration tools to support distributed meetings. Centra provides facilities for sharing applications and data across sites, but the communication features are of particular interest here. Centra allows participants to communicate through voice-over-internet-protocol (VoIP) technology, which digitizes the audio coming into the computer through a microphone, and sends it to the other sites over the Internet instead of over telephone

lines. However, in an effort to save bandwidth, only one person can speak at a time in most Centra conferences. Similarly, it is possible to show live video from any of the participating sites. However, only one site can be displayed at a time, not all sites will necessarily have video available, and different camera positioning may make some people more or less visible. Centra does provide for some backchannel communication, through both text-based communication (a chat window) and emoticons—icons of a happy face, clapping hands, a red X (to signal “no”) and a green check mark (to signal “yes”). Additionally, participants who wish to be given the floor can raise a virtual hand. However, this provides a very limited set of backchannel responses, and because of the design of the interface, backchannel messages may be missed.

Obviously, interactivity in Centra’s “virtual meeting” software comes at a higher cost than in a face-to-face meeting. Even though it is feasible for all participants to speak and be seen in the video, the mechanics of “passing” the microphone or switching camera views require extra effort and create delays. The backchannel emoticons are limited to the kinds of signals that one might get in a large lecture hall: happy faces (like smiling), green check marks (like nodding), and applause. However, Centra makes it easier to give positive responses than to give negative. While there is a red “X” to parallel the green check mark, there is no sad face or negative analogue for applause.

One thing to note, however, is that even though the costs for interactivity are higher in Centra than in a face-to-face situation, interactive communication is not impossible. Experienced participants learn to use the emoticons and text chat to convey more complex ideas (for example, by using the icons in combination to signal more intense emotion). Experienced presenters become adept at polling the other participants

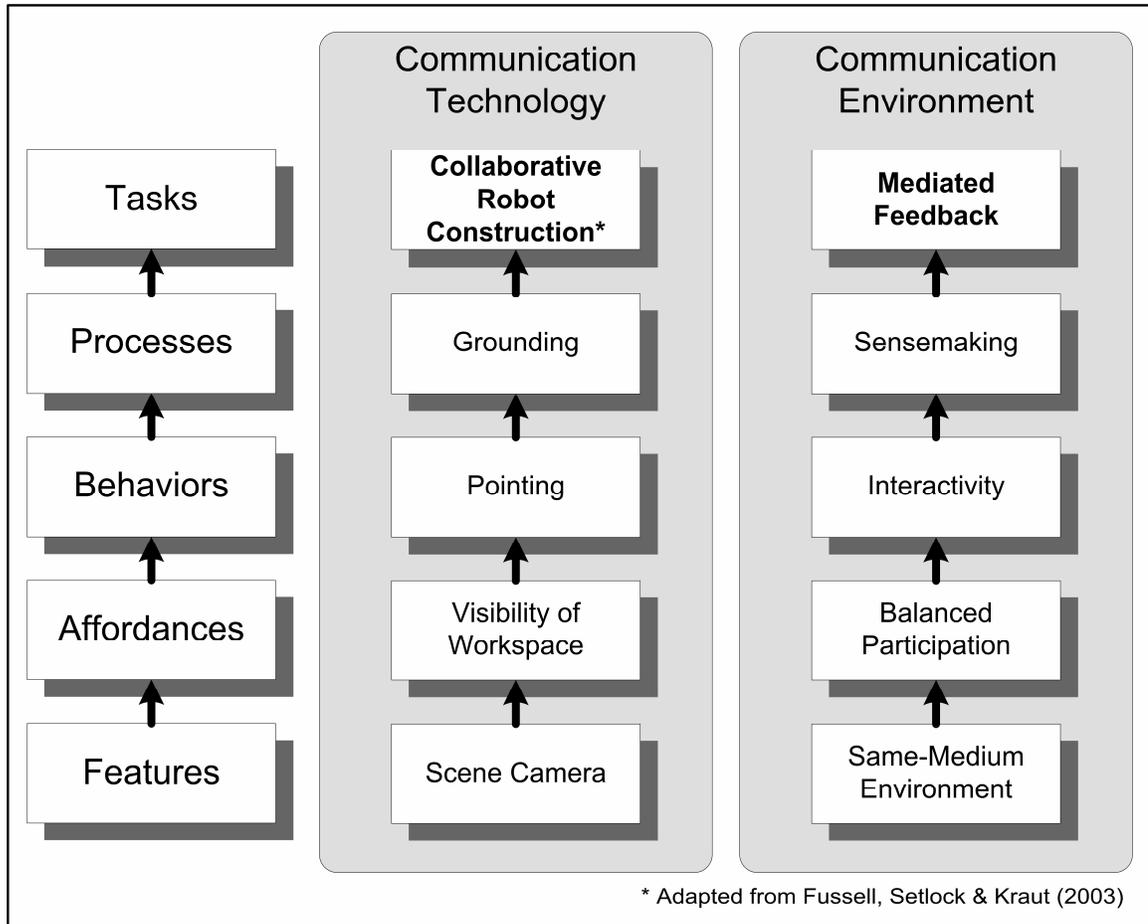


Figure 2: How features of a communication medium/environment affect task performance.

to make sure that everyone is following along and to provide an opportunity to correct any misunderstandings.

Figure 2 shows how tasks are supported by features of a communication environment, with examples from the CMC literature and the current study. Most CMC research has been concerned with predicting task performance from the features of a particular technology. Typically, the affordances of a technology can be thought of as “features-in-use.” Affordances enable behaviors, which give rise to communication processes in support of a task. The connections between layers in the diagram are not necessarily one-to-one—for example, a single feature may afford several different kinds

of communication, and it may be that several affordances in conjunction support a single kind of behavior. Fussell, et al. (2003) for example focus on how different communication technologies support collaborative construction of a toy robot. In their study, a fixed scene camera affords workspace visibility, which supports pointing behaviors that help with reference and grounding processes. They found that use of the wide-angle fixed scene camera resulted in better task performance than a head-mounted camera, which did not provide visibility of the entire workspace.

The current study focuses on the ability of a communication environment to support interactivity, and how that affects the success of a mediated feedback task. The right column of Figure 2 illustrates one specific hypothesized connection from the features of the communication environment to the feedback task. In a same-medium environment, we expect that the costs of participation will be the same for all participants, which will afford balanced participation. This in turn supports interactive behaviors like interlocked and contingent communication, which promote better sensemaking, and should result in a better feedback process. This and other hypotheses will be discussed in greater detail in the next sections.

The definition of interactivity that I have developed here shares some commonalities with the “interactivity principle” put forth by Burgoon, et al. (2002; 2001). They parse interactivity into a set of affordances including contingency, participation, synchronicity, proximity, and richness of nonverbal contextual information. They also look at interactivity from a phenomenological standpoint, and suggest that it is also characterized by the degree of cognitive, emotional and behavioral involvement, interaction ease, coordination, and mutuality. While this definition of interactivity seems

similar to the one I use, it is also much broader. While I prefer the language of interactivity because of its connection to the “double interact,” if I were to use Burgoon et al.’s language, I might say that I am focusing on contingency effects, and how they are mediated by participation and richness.

The breadth of Burgoon, et al.’s concept of interactivity can be seen in one study where the three hypotheses suggest that: 1) mediated is different from unmediated interaction, 2) proximal is different from distal interaction, and 3) face-to-face and audio interaction will be more favorable than text and video (Burgoon et al., 2002). I would argue that these hypotheses are theoretically problematic. The first hypothesis groups all “mediated” communication into a single category, and does not recognize that “face-to-face” communication is also subject to a number of environmental effects (e.g. sitting around a large conference room table may not be the same as sitting next to each other on a train). The second hypothesis treats “proximate” and “distal” as binary categories, when distance tends to operate more like a continuous variable (O’Leary & Cummings, 2007). The third hypothesis treats each category of communication as consistent, whereas I would argue that, for example, not all textual media afford equal interactivity, and there is significant overlap among the categories (e.g. e-mail is less interactive than telephone conversations, but text chat is may be more interactive than voice-mail).

Burgoon, et al. do make an important point, however, in that media affordances are in themselves neutral. For example, while in many situations we would assume that more interactivity would be better, higher levels of interactivity may actually hinder our ability to detect deception (Burgoon et al., 2001).

Strategy and Experience in Feedback Communication

One of the factors discussed above is that communication success is determined not only by the communication environment, but also by the strategies adopted by the participants. In media where back-channel communication is limited, a speaker may be more likely to explicitly ask if the listener has understood. If it is more difficult or takes longer for conversational turns to be sent and received, then a speaker may put more information into a single turn. In media where it is difficult to ascertain the emotional impact of one's statements, we may see attempts to reduce negativity through the use of additional politeness cues. The strategies that are adopted will work best in a particular kind of communication in a particular medium.

Over time, both the communication needs and strategies available may change. As individuals develop a relationship and learn more about each other, the need for relational communication is likely to decrease (Walther & Burgoon, 1992). Additionally, as they gain experience working together within a particular medium, they will pick up more strategies and have greater resources to cope with any constraints the medium presents. As such, it is expected that the effects that I am interested in will be most pronounced in zero-knowledge situations, when the participants have not previously met. It will be important in future research to understand how these needs and strategies may change over time, but that question is outside of the scope of the current study.

The next section will focus on how interactivity changes in the communication environment are expected to affect feedback communication.

Effects of Media Interactivity on Feedback Communication

In this section, I will discuss the ways that the interactivity of the communication environment can affect feedback success. Building on a framework adopted from (Ilgen et al., 1979), I will discuss the effects of interactivity on source credibility, on the pertinent characteristics of the message, and on the characteristics of the recipient (see Figure 1). This will lead to more general expectations about feedback acceptance and mediated communication.

Source Credibility

Source credibility refers to the belief by a listener that a speaker is telling the truth, and is a fundamental tenet of interpersonal communication. The basic concept has been of interest to philosophers for centuries (e.g., Aristotle's concept of 'ethos'), but came under the lens of social psychology in the mid-twentieth century (Giffin, 1967).

Hovland, Janis, & Kelley (1953) found two factors that affected source credibility:

- 1) the extent to which a communicator is perceived to be a source of valid assertions (his expertise) and 2) the degree of confidence in the communicator's intent to communicate the assertions he considers most valid (his "trustworthiness"). (p. 21)

A number of other studies have found that source credibility can be decomposed into additional factors, including, for example, dynamism (Berlo, Lemert, & Mertz, 1969), and objectivity (Whitehead, 1968). While the factor-analytic approach to source credibility has been criticized (Cronkhite & Liska, 1976), there seems to be general agreement on Hovland, et al.'s original conception, and I will use validity and trustworthiness to frame this discussion.

Source Validity

One of the important factors that will influence the recipient's reaction to feedback will be whether the source is perceived to have a legitimate basis for giving feedback. Feedback that comes from someone who has appropriate status in relation to and more power over the recipient is more likely to be accepted (Huse, 1967). In an organizational context, an immediate supervisor is often one of the most legitimate sources of feedback. Depending on the context, legitimate sources of feedback may also be at the same or even lower levels in the organizational hierarchy, but this is less likely. (Fournier et al., 2002) found that individuals have different reactions to criticism based on the status of the criticizer. They are more likely to accept and submit to criticisms from a superior, and more likely to quarrel when criticized by subordinates. While the power that the source has over the recipient is an important part of status, it is not the only one (Ilgen et al., 1979).

Expertise is another important component of source validity (Ilgen et al., 1979). If the recipient perceives that feedback is coming from someone who lacks sufficient expertise, the feedback is unlikely to be accepted. This expertise effect encompasses both knowing the subject matter and knowing enough about the behavior in question to give accurate feedback. Personality feedback is significantly more believable when it comes from a graduate student or PhD clinical psychologist than from an undergraduate, who is perceived to know less about psychology (Halperin, Snyder, Shenkel, & Houston, 1976). On the other hand, teachers are more receptive to performance feedback from students than from supervisors, because supervisors typically have little opportunity to directly observe the teacher's work (Tuckman & Oliver, 1968).

Sources who are perceived to be part of the recipient's ingroup are more likely to be seen as legitimate than outgroup members. Shared identity and ingroup effects have been recognized in many aspects of team functioning, including communications, cohesiveness, cooperation, and general satisfaction (Maznevski, 1994; K. Y. Williams & O'Reilly, 1998). Feedback processes are no exception. Hornsey and colleagues have identified the "intergroup sensitivity effect": criticisms from outgroup members tend to be met with defensiveness and lower acceptance (Hornsey & Imani, 2004; Hornsey, Oppes, & Svensson, 2002).

The interactivity of a communication environment will affect the feedback recipient's perception of the source's validity. One line of research suggests that computer-mediated communication may, in fact, reinforce power differentials (Spears & Lea, 1994). However, in computer-mediated communication, many social context clues are reduced, and status differences and source expertise will be less salient (Driskell, Radtke, & Salas, 2003; Dubrovsky et al., 1991; Sproull & Kiesler, 1986). When interactivity is reduced, people will tend to be less aware of the education and areas of expertise of their colleagues (Cramton, 2001). When feedback recipients cannot accurately perceive the status of the feedback source, feedback acceptance is likely to be reduced.

Feedback recipients must also believe that the person giving feedback has been able to adequately evaluate the object of feedback in the context in which it is intended. When interactivity is low, feedback recipients may find it more difficult to fully explain their work, their motives, or the context they were imagining. If the recipient feels that the source has misunderstood anything about the work, it will be more difficult to provide

more information or clarification. In such cases, the recipient is likely to discount the feedback.

To summarize, feedback acceptance is influenced by the recipient's perception of the validity of the source. Source validity encompasses perceptions of the source's expertise, power, and status. The feedback recipient's perception of source validity will be positively related to the level of interactivity in the communication environment.

Source Intent & Trust

Understanding the source's intent is a particular challenge when interpreting feedback messages. The recipient needs to decide if the feedback can be taken at face value, or if there is a need to "read between the lines." This judgment relies, to some extent, on understanding the motives of the feedback source. Intent, however, is elusive—it cannot be observed directly, and if someone does have less than honorable intentions, it is likely he will try to hide them.

Having a grasp on the context in which the feedback was offered can help illuminate the source's intent. For example, the interpretation of the message may be influenced by whether the feedback was offered in public or in private. In an organizational setting, someone offering feedback in public may be more interested in showing off their own critical faculties rather than in providing helpful advice to their colleague. Feedback can provide a site for playing out tensions that have little to do with the expressed topic of the message, like turf wars or process conflict. Knowing these contextual factors can be important in deciding whether to accept feedback.

Disingenuousness in the feedback process can result from positive as well as negative impulses. Even the closest colleagues may give inaccurate feedback to shield the

recipient's feelings or help her "save face." Instead of giving a negative review, the source may couch the message in more polite language, may give a vague, ironic, or equivocal response, or may even lie (DePaulo & Kashy, 1998; Dews & Winner, 1995). Edwards & Bello (2001) found that equivocal messages are seen as more polite, even though equivocation is generally judged to be a less competent form of communication. Similarly, supervisors can make use of ambivalent language to moderate the face-threat when criticizing subordinates, but there is a risk of being misunderstood (Wajnryb, 1998).

Research on distributed teams suggests that determining intent can be particularly difficult when feedback is communicated in a low-interactivity environment. Individuals in distributed teams are more likely to make fundamental attribution errors: they are more likely to attribute intent to something internal or dispositional rather than external and situational (Cramton, 2002). For example, in the context of feedback acceptance, the recipient may believe that the source was responding more to their own feelings about the recipient (internal attributions) than to the recipient's performance (external attributions).

When intent is unclear, relational factors become especially important. Trust between the recipient and source of feedback determines acceptance in such situations (Giffin, 1967). Does the recipient trust that the person giving feedback has the recipient's best interests at heart? Does the recipient trust that the source is telling the truth? If the recipient trusts the source, then it is more likely that she will accept the feedback (Ilgen et al., 1979).

Trust in computer-mediated communication has been studied extensively. By comparing trust across various media in an experimental setting, (Bos, Olson, Gergle,

Olson, & Wright, 2002) demonstrated that trust was most difficult to establish in lean media like text chat. Face-to-face settings gave the highest levels of trust, with video- and audio-conferencing close behind. However, trust was slower to develop and more fragile in all the electronically mediated conditions. Virtual teams may also develop a form of “swift trust” (Meyerson, Weick, & Kramer, 1996), but this tends to be particularly fragile (Jarvenpaa & Leidner, 1999).

This does not mean, however, that trust can not exist in CMC. Several strategies have been proposed for building or repairing trust in low-interactivity environments. For example, having periodic face-to-face meetings, or even just having social conversations before getting down to business can help build trust (Rocco, 1998; Zheng et al., 2001). But in general, and especially in the absence of any explicit remedies, participants in computer-mediated communication demonstrate less trust, the trust is slower to develop, is more difficult to maintain.

In this section, several factors have been discussed that contribute to feedback credibility. Generally, low interactivity will make it more difficult to determine intent, and decrease the level of trust. Taken together, this suggests that the level of interactivity in the communication environment will be positively related to the feedback recipient’s perception of the source’s credibility.

Characteristics of the Message

After source credibility, a second area of concern in feedback processing has to do with characteristics of the message itself. In this section I will consider some of these factors as they relate both to the content and the style of the feedback message.

Message Content

Feedback sign—whether the message is positive or negative—is one of the most studied determinants of acceptance (Baughman, 1988; Ferstl, 2000; Garza & Lipton, 1978; Haeggberg, 2000; Halperin et al., 1976; Hoxworth, 1989; Jacobs et al., 1973; Johnson & Nawrocki, 1967; Levy, 1990; Mesch, Farh, & Podsakoff, 1994; Podsakoff & Farh, 1989; Shao, 1997; Waldersee, 1994; Zhou, 1997). Positive feedback is accepted more readily than negative feedback (Ilgen et al., 1979). This robust finding is usually interpreted in line with ego-protection motives: individuals will tend to accept feedback that confirms or enhances their own self-image (Feather, 1968; Ilgen, 1971; Shrauger & Rosenberg, 1970). However, feedback sign effects can be complex. For example, individuals with high self-efficacy are less likely to accept negative feedback, especially over repeated trials (Nease et al., 1999). This can also be understood as a kind of expectation-confirmation: individuals are less likely to pay attention to feedback that violates their expectations (Ammons, 1956). Acceptance is also complicated by the “praise paradox”: in some cases, a recipient of praise may infer that the praise results from the source’s low expectations (Cohen, Steele, & Ross, 1999; Wulf-Uw Meyer, 1979; Wulf-Uwe Meyer, 1992).

An important but under-researched component of message content is whether or not the feedback message is relevant to the task and goals of the recipient (McGuire, 1968). Several sources advise that, when giving performance feedback or criticism, it is important to point to the specific incidents or behaviors that led to the feedback (Baron, 1988; Leskovek, 1967; Weick, 2001). An assumption in almost all studies of feedback acceptance is that the feedback will be on topic. While this may seem obvious, it is an

assumption that is easily violated in organizational settings. An employee may receive feedback about a project with which she is not involved. Or, perhaps, that through some miscommunication, she requests feedback on Product A, but receives feedback on Product B. Another related problem of relevance stems from a lack of shared task or goal conceptions. If the source and the recipient do not have similar understandings of the purpose of the behavior that is being reviewed, the feedback will have less value.

Interactivity is likely to affect both message content and relevance. First, feedback will tend to be more negative. There is often a social pressure to provide positive feedback, especially when the feedback may contradict the recipient's self-image (Blumberg, 1972; Langer & Wurf, 1999). However, lower interactivity can lead to a reduction in the power of social norms, and the content of the messages may become more important than saving face for the recipient (Hiltz, Johnson, & Turoff, 1986; Kiesler et al., 1984; Siegel et al., 1986; Sproull & Kiesler, 1991).

Hebert and Vorauer (2003) studied computer-mediated feedback in comparison to face-to-face feedback, focusing on differences in the negativity and clarity of the feedback message, as well as the accuracy of subjects' interpretations of the feedback. They asked subjects to give feedback on a writing task, either face-to-face or through e-mail. They found that "skills" feedback was more negative in computer-mediated communication than face-to-face, although the effect did not hold for "liking" feedback. Skill feedback also tended to be more clear in face-to-face feedback. They also looked at feedback recipients' meta-accuracy—in other words, the accuracy of the recipient's perception of the source's feelings. They found that, generally, subjects' ability to interpret the meaning of the feedback did not significantly vary across communication

media, although there was some suggestion that meta-accuracy may be compromised in computer-mediated communication.

Feedback relevance is also likely to be affected by interactivity. It is through interaction that communicators develop a shared task conception. When interactivity is limited, feedback recipients will find it more difficult to discover and correct the source's mistaken assumptions.

Message Style

The way in which feedback is communicated will also influence the likelihood of its acceptance. A number of studies have focused on strategies that are used to craft a feedback message. Some attempt to describe what strategies are available and what factors influence the adoption of those strategies, while others focus on instruction for feedback sources on how to best phrase praise or criticism. Unfortunately, only a few have directly focused on how choice of communication style by the source influences feedback acceptance.

Dews & Winner (1995), for example, find that irony is an effective strategy for muting the force of feedback. Compared to literal statements, ironic criticism is perceived to be less negative, and ironic praise is seen as less positive.

Managers who use politeness to soften the blow of criticism are often perceived to be more competent communicators and more fair with their employees. Carson & Cupach (2000) surveyed employees in a large firm about an incident in which they were reproached by their supervisors, and the reproaches were categorized by their level of politeness. Polite reproaches were perceived to carry the least face threat, and were associated with higher perceived fairness and communicator competence.

Wajnryb (1998) suggests that ambiguous feedback can be a useful managerial tool. She finds that the “naturally slippery” character of language creates a space in which to discuss potentially difficult subjects without the face threat that criticism often entails. However, adopting this strategy can be difficult and risky.

Edwards & Bello (2001) outline some of the risks associated with taking such an approach. They suggest that equivocation—the use of vague or ambiguous messages—can influence the recipient’s perception of the speaker’s communication competence. In their study, they focused on reactions to feedback messages that varied in their level of equivocation. They found that speakers who gave equivocal feedback were generally perceived to be less honest, less competent as communicators (in contrast to Carson & Cupach’s findings), and more polite than speakers who do not. They also found that the perception of equivocators changed depending on the circumstances for the feedback. If the individual’s performance was obviously poor, equivocal communication is seen to be less competent. However, if the situation is truly ambiguous, equivocal communication is perceived to be more competent than unequivocal.

Several aspects of message style are likely to be affected by communication environment. Non-verbal communication is constrained even in the richest computer-mediated communication, but politeness strategies often depend on non-linguistic cues (Ambady, Koo, Lee, & Rosenthal, 1996). While communicators may adapt their politeness strategies to the communication media in use (for example, through the use of emoticons), it is not clear that all speakers will adapt in the same way. For example, while women tend to be more polite in face-to-face conversation than men, Hobbs (2003) found that men and women are equally polite in voice-mail communications. Because the

study only compared between genders and not between various media, it is unclear whether men are more polite or women are less polite in voice-mail messages compared to other kinds of messages.

Given the lack of richness in computer-mediated communication, attempts to use irony, joking, equivocation or other politeness strategies may backfire. Low interactivity can make it that much more difficult to repair any miscommunications. These strategies create opportunities for misunderstandings and misinterpretations, which can be especially problematic in distributed groups (Armstrong & Cole, 2002). Damage from misunderstandings will be more costly if there is a delay in correcting the mistakes (Clark & Brennan, 1991). Communication media like e-mail that lack cotemporality will make it significantly more difficult to quickly repair misunderstandings, but even slight delays can lead to problems (Krauss & Bricker, 1966; Kraut, Fussell et al., 2002; O'Connell, Whittaker, & Wilbur, 1993).

Characteristics of the Recipient

The last major category of factors influencing feedback acceptance have to do with personal characteristics of the recipient. In the context of the current study, which is focused on the impacts of distance and mediated communication, these factors function primarily as controls.

Personality

Individual personality plays an important role in determining feedback acceptance. "Type A" and "Type B" individuals respond differently to criticism, with Type B individuals engaging in "supportive self-talk" to maintain their self image (M. E.

Williams, Davison, Nezami, & DeQuattro, 1992). Others have taken a more direct approach, and shown that some individuals exhibit higher “sensitivity to criticism” than others. Sensitivity to criticism correlates not only with higher levels of psychological disorders like depression, but also with behaviors such as avoidance of criticism (Atlas, 1994).

A good deal of work has been done on linking self-efficacy and self-esteem to acceptance of feedback. Self-esteem is negatively correlated to sensitivity to criticism (Atlas, 1994). Students who exhibited high “Unconditional Self-Acceptance” were less likely to react negatively to others who gave them unfavorable feedback (Chamberlain & Haaga, 2001). Self-efficacy affects how individuals interpret feedback that they are given (Silver, Mitchell, & Gist, 1995). Upon receiving positive performance feedback, individuals with high self-efficacy tend to interpret it as due to internal causes (their own ability and effort), whereas low-self-efficacy individuals attribute it to external causes (level of task difficulty, luck). The pattern is reversed for negative feedback.

Feedback in organizations tends not to be a single event, and is better characterized as an ongoing stream of behaviors and reactions to those behaviors (Bilodeau, 1966). While self-efficacy can affect how feedback is accepted, it is also the case that accepted feedback can influence future self-efficacy (Baron, 1988). This is particularly important in repeated feedback situations. Whereas high self-efficacy individuals may be buffered against the effects of negative feedback, individuals with low self-efficacy may find themselves trapped in a negative spiral (Nease et al., 1999). Because negative feedback is consistent with their expectations, they will accept the feedback. In accepting the feedback, it will reinforce their self-efficacy, and make future

acceptance of negative feedback more likely. Nease, et al., also found that the reverse case is true: low self-efficacy individuals are less likely to accept positive feedback and more likely to discount repeated instances of positive feedback.

An important take-away from these studies is that self-efficacy is a protective factor that moderates the relationship between feedback sign and feedback acceptance. Individuals with high self-efficacy are buffered against the effects of negative feedback. While high self-efficacy can help individuals maintain their self-image, this does not necessarily imply beneficial organizational outcomes. For example, if an employee's self-image is out of line with his performance, it may be difficult for a supervisor to "get through" to the employee and convince him to change his behavior.

In the context of this study, even though personality may moderate the relationship between other factors and feedback acceptance, there is no expectation that personality will be affected by characteristics of the communication environment.

Culture and Gender

While several studies have hypothesized that gender plays a role in how individuals respond to feedback, the results have not been entirely conclusive. For example, Bresnahan, Morinaga Shearman, Lee, Ohashi, & Mosher (2002) found that, while men tended to be more assertive and aggressive than women, they found that men did not respond more aggressively to criticism than women. On the other hand, Wilson, Lizzio, Whicker, Gallois, & Price (2003) found that women and men have qualitatively different responses to unfair feedback. Their finding is consistent with a "social rules" framework, that suggests that behaviors are more effective when they conform to social expectations based on gender and status. Men and women also interpret feedback

differently, depending on the style in which it is communicated. Females find equivocal messages more polite than do males, although it is not clear that this has an effect on feedback acceptance (Edwards & Bello, 2001).

The case for cultural differences in feedback processes is much more clear. One model of cultural differences in response to feedback is based on whether the culture is individualist or collectivist (Stone-Romero & Stone, 2002). The model is based on research that suggests that individuals who are motivated by more individualistic motives may not respond appropriately to feedback. Other studies have taken an experimental approach to examine differences in feedback interpretation and acceptance across cultures. Takeuchi, Imahori, & Matsumoto (2001) found that Japanese prefer feedback to be more indirect than US Americans, and that subjects are able to adjust their criticism style to the cultural context. Other studies have identified different responses to feedback among Mexicans and Anglo-Americans (Garza & Lipton, 1978), English and US Americans (Earley, 1986), and US Americans, Chinese and Japanese (Bresnahan et al., 2002).

Finally, although not studied extensively, some research suggests that members of stigmatized groups may respond to praise and criticism differently than members of non-stigmatized groups. Comparing black and white students, (Cohen et al., 1999) found that black students can have a “paradoxical” reaction to criticism, in that they perceive praise to be an indication that the evaluator has low expectations of them. Black students motivation was more adversely affected by criticism than White students, although this effect could be erased by “wise” feedback that not only provided criticism but also invoked high standards.

In the current study, gender and culture will be controlled through both procedural and statistical means. Pre-screening will ensure that all subjects are competent English speakers, and that subjects have lived in the United States long enough to become familiar with local cultural norms. Demographic information will be collected from subjects, and used to test for cultural interactions.

Overall Effects on Feedback

Several propositions have been put forward about how the interactivity of a communication environment will affect how the recipient responds to feedback. Source credibility, in terms of both validity and trust, will be positively related to interactivity. In low interactivity environments, recipients will perceive feedback to be more negative, less relevant, less polite, and less skillfully communicated. Recipients are more likely to accept feedback that is credible, positive, relevant, polite, and skillfully communicated. As such, feedback success will be positively related to the interactivity of the communication environment.

The next chapters discuss two experiments designed to test the various hypotheses presented here. Each section will elaborate on the experimental design and metrics for testing these hypotheses, and present the results obtained from the experiments. The final chapter will then provide a discussion of the results and implications for future work.

CHAPTER 3

EXPERIMENT 1

Introduction & Hypotheses

This chapter presents an experiment that was conceived to examine the feedback process in electronically mediated environments and to provide data about how recipients respond to this feedback. In the experiment, one participant will critique a document written by another participant. The Critic will deliver feedback about the document to the Writer in one of four media conditions that will vary in levels of conversational interactivity. The experiment will test several hypotheses about how the interactivity of the communication environment will affect perceptions of source credibility, the content and style of the feedback message, and feedback acceptance.

In organizational life, it is not uncommon to receive critiques of one's work. This experiment replicates this moment of critical appraisal. In the experiment, one subject creates a document, and a second subject gives feedback to the first subjects about how to make the document better. The feedback is delivered in a conversation conducted in one of four electronically mediated communication environments that differ in their level of interactivity.

To this point, we have spoken of interactivity in general theoretical terms, but this experiment will demonstrate that changes in the communication media will affect the

interactivity of the conversation. A highly interactive conversation is marked by several characteristics. First, we expect interactivity to be related to the cost and speed of communication afforded by the communication medium; high levels of interactivity will show a large amount of information shared in a given period of time. Second, in order to produce interlocked and contingent interaction, both participants should have an equal opportunity to contribute to a conversation. Highly interactive communication will be marked by relatively equal levels of participation by all participants. Finally, highly interactive conversations will be marked by back-and-forth discussion of topics, rather than a series of unconnected statements. These features—amount, balance, and interlocking of communication—provide a measure of the interactivity of communication environments.

A consistent finding from the social psychology and group dynamics literature is that group conversations tend not to have balanced participation. Instead, contributions tend to follow an exponential curve, with the most participation by a few people, and little or no participation by the rest (Stephan & Mishler, 1952). Groups tend to follow these same patterns in both face-to-face and electronically mediated interactions (Straus, 1996; Weisband, 1992). It's not clear, however, that this typical conversational process always produces the best outcomes. In fact, many of the hypotheses presented in the next section explicitly suggest that when giving feedback, more interactive conversations will be more effective.

Feedback Content and Style

We expect that the content and style of feedback will vary with the interactivity of different communication environments. Cultural and social norms may provide

guidelines for how to give feedback, but as others have suggested, these norms are often not as strong in electronically mediating contexts (Sproull & Kiesler, 1991). Most explanations for this effect focus on feelings of distance and anonymity in these environments. Hebert and Vorauer (2003) found that critics gave less positive feedback in e-mail than in face-to-face communication, but do not examine the communication processes that lead to this finding. Here it is suggested that the presence of a rich backchannel allows the development of interconnected and interdependent interaction (Krauss & Fussell, 1991). If a Critic can observe the recipient's reaction to feedback, he is more likely to be aware if his comments are inappropriate or hurtful, and can then change the tone of his feedback. Without that awareness, negative comments are less likely to be filtered. Additionally, greater levels of interactivity will help the Critic understand the reasoning behind the Writer's choices, leading to less negative judgments.

***Hypothesis 1:** The level of negativity of the feedback will be inversely related to the interactivity of the communication environment.*

While Critics may change the ratio of positive and negative feedback in response to the Writer's reactions, they can also employ other emotion management strategies. Threat regulation is the process by which individuals understand and manage other people's perceptions of threat (M. Williams, 2007). Overly negative or harsh feedback can pose a threat to the recipient's self-image and is less likely to be accepted. The threat can be reduced, for example, through the use of politeness cues or by withholding bad news. Typically, the goal of threat regulation is to still be able to deliver critical feedback, but in a way that poses less threat to the recipient. Threat regulation depends on the ability to take the perspective of another person and to see the impact of one's own actions. Interactivity in conversation will support this perspective taking and awareness.

Hypothesis 2: *The level of threat regulation in a feedback conversation will be positively related to the interactivity of the communication environment.*

Being able to monitor a communication partner's reactions is also important for building shared understanding. As has been demonstrated for conversational grounding, in more interactive environments, it will be easier to signal confusion, and misunderstandings are more likely to be discovered (Clark & Brennan, 1991). When the cost of sending messages is lower, it will be easier to provide more clarifying information. Additionally, interactivity will better support sensemaking processes (Weick, 1979).

Hypothesis 3: *Shared understanding will be positively related to the interactivity of the communication environment.*

Perceptions of Source Credibility

As described in the last chapter, the level of interactivity is expected to affect the recipient's perceptions of feedback source credibility. When communication costs are higher, it is less likely that the source will share personal or other seemingly off-topic information. But it is this information that gives the recipient the necessary confidence that the critic has adequate expertise and is trustworthy. In low-interactivity environments, the participants will also find it more difficult to develop a feeling of mutuality—that they are “in this together.”

Hypothesis 4: *The recipient's trust in the feedback source will be positively related to the interactivity of the communication environment.*

Hypothesis 5: *The participants' feelings of mutuality will be positively related to the interactivity of the communication environment.*

Feedback Acceptance and Response

All of the hypotheses stated contribute to the way that a recipient responds to critical feedback. Empirical evidence suggests that people are more likely to believe positive than negative feedback (Ilgen et al., 1979). The way messages are phrased is important—recipients are more likely to reject feedback that damages their self-image (Edwards & Bello, 2001). Recipients will have a hard time using feedback that they do not adequately understand. Source credibility is also crucial for feedback acceptance (Ilgen et al., 1979). As a result, we expect that subjects are more likely to accept and use feedback delivered in more interactive environments.

***Hypothesis 6:** Feedback acceptance will be positively related to the interactivity of the communication environment.*

***Hypothesis 7:** Recipients' satisfaction with the feedback will be positively related to the interactivity of the communication environment.*

Gender

Much of the feedback literature (and social psychology research in general) points to the importance of gender as a determinant in interpersonal interactions. Mixed-gender pairs tend to function differently than same-gender pairs; this experiment will control this variance by using only same-gender pairs. Additionally, while there are no specific expectations about how men and women will differ in feedback processes or outcomes, we do expect that gender may moderate or mediate the relationships among independent and dependent variables. As such, gender will be included in the analyses. Gender results will only be reported where significant.

Method

This section explains the procedures used to examine the hypotheses stated above. In the experiment, one participant creates a PowerPoint presentation based on a fictional business case study. A second participant then provides feedback to the first participant. This feedback is delivered in one of four electronically mediated communication conditions. In two conditions, subjects communicate in the same medium. In two conditions, the person giving feedback (the “critic”) uses a different communication medium than the person receiving feedback (the “writer”). The rest of this chapter presents the experimental method and discusses the results.

Participants

Participants were recruited through a general subject pool at a large Midwestern university. The pool is open to all members of the university and general community, and subjects have been recruited through newspaper advertisements, at university events, and by word of mouth. Compared to many undergraduate student pools, the average age was higher and subjects had a more diverse educational background.

Forty sessions were conducted with matched-gender pairs of subjects. Table 2 details how many sessions were conducted in each experimental condition.

Table 2: Sessions in each experimental condition.

| | | Critic (sending) | |
|-------------------------|--------------------------|--------------------------|--------------------------|
| | | Instant Messaging | Videoconferencing |
| Writer (sending) | Instant Messaging | 5 male + 5 female | 5 male + 4 female |
| | Videoconferencing | 5 male + 4 female | 7 male + 5 female |

There were a total of 44 male and 36 female participants. Three complete sessions have been excluded from the analysis. All excluded sessions happened to be Condition 4-Male. Two “Writers” had difficulty with PowerPoint while completing the task, and had clearly lied about their computer experience during the pre-screening. Additionally, one subject elected to turn off the video portion of their videoconferencing, and used only the audio portion. (In the debrief, their partner remarked that it seemed like the other subject “never looked at me.”) These sessions were also outliers on several variables of interest. With these exclusions, there are only 4M + 5F valid sessions in the video/video condition.

The average participant age was 24 years, and ranged from 19 to 62 years. Eighty percent were between 19 and 24 years old. Forty-three subjects (54%) were white, fourteen (18%) were black or African-American, twenty (25%) were Asian, two were multi-racial, and one checked other and wrote in “American.” All subjects spoke English as their first language.

The highest level of education achieved was a high school diploma for 49 subjects (39 of whom were currently college students), an undergraduate degree for 22 subjects, and a graduate degree for 9 subjects. All subjects were regular computer users. For example, 77 of 80 subjects reported daily e-mail use, and the other 3 reported using e-mail at least once per week.

Most of the subjects (66/80) had no experience with videoconferencing; the rest reported using it less than once per week. An interesting side-note is that Asian subjects ($M=2.050$, $SD=.9987$, $n=20$) reported using webcams significantly more than either

White ($M=1.372$, $SD=.6555$, $n=43$,) or Black ($M=1.214$, $SD=.4258$, $n=14$) subjects (post-hoc Scheffe analysis shows these differences to be significant, $p<.05$).

Instant Messaging use was a little more mixed. Slightly more than half the subjects used IM daily. There was also a significant negative correlation between IM use and age ($r=-.229$, $n=80$, $p<.05$, two tails). A prerequisite for participation was that subjects have used IM in the past year, and in pre-screening, all subjects answered that they used IM. However, in the demographic questionnaire at the experiment, two subjects indicated that they had never used IM. Because these subjects do not appear to be outliers in other analyses, and one was in the video-conferencing only condition, they were not excluded from analysis.

PowerPoint use also directly related to the experimental task, and having used PowerPoint in the past year was a prerequisite. In the demographic questionnaire, only one subject reported not having used PowerPoint at all. Because that subject was in the “critic” role, he did not have to use PowerPoint himself, so his data was not excluded from analysis. PowerPoint use was not related to age, but men ($M=2.750$, $SD=.7510$, $n=44$) tended to use PowerPoint more than women ($M=2.222$, $SD=.5404$, $n=36$) This difference was significant, $t(78)=3.533$, $p<=.001$, two-tailed.

Task/Procedure

Upon entering the lab, participants were randomly assigned to either the writer or critic role. Subjects were not introduced to each other, and were escorted into separate small offices as soon as they arrived. In order to ensure that participants did not know each other before this study, each participant was read a list of 6 names, one of which

was the name of the other participant. Two subjects recognized the name of the other subject, and they were reassigned to other sessions. After reading and signing consent forms, subjects completed a pre-experiment questionnaire covering demographics, computer use, and self-efficacy.

Writers were given instructions and a copy of the business case study, “Do Something, He’s About to Snap” (cite). The instructions for both subjects told them that they were to play the role of consultants to the company discussed in the case study. The writer was told that after reading the case study, she should create a PowerPoint presentation suggesting a solution to the problem in the case study. The instructions also gave some further instructions about the expected content and layout of the presentation (e.g. four slides total). The instructions also explained that the presentations would be graded, and that high scoring presentations would earn a monetary bonus. The writer was given ten minutes to create the presentation. Once the writer completed the presentation, all study materials were taken away from the participant, and the experimenter explained that because the company was such an important client, the writer’s “boss” wanted to have another consultant look the presentation over before it was sent to the client. While that was happening, the participant was free to check e-mail, browse the web, or work on other work.

Meanwhile, the Critic was given the same case study, and told that another consultant in the same consulting company was creating a presentation. The critic would be giving the other consultant feedback about how to make the presentation better. The critic was also told that the presentation would be graded, and that her or his bonus would be determined by the final quality of the writer’s essay. After the writer had finished the

presentation, it was delivered electronically to the critic, who had ten minutes to read it and prepare feedback for the other consultant.

The critic and writer were then connected in one of four electronic communication environments (described in the next section). The subjects were given ten minutes to discuss the presentation. The writer was allowed to take notes on paper, but would not be able to save any text conversations for later use. These conversations were video-recorded, and any text communication was logged.

After the discussion, subjects were disconnected. The writer was given “as long as needed” to edit the presentation before submitting the final version. All subjects took less than thirty minutes to edit their presentation.

Both subjects completed post-experiment questionnaires about the experience of giving/receiving feedback, and their perceptions of the task and the other participant. Finally, subjects were separately debriefed about the full purpose of the study, asked not to reveal the details to anyone else, and compensated for their time (with the full bonus).

Media conditions

The feedback conversation between the critic and writer used electronically mediated communication channels, in one of four configurations. These four conditions used two different kinds of media channels. The two media used were video-conferencing and text-based Instant Messaging (IM).

The video-conferencing channel used analog television signals for video, which provided a high-quality image with no appreciable delay and none of the technical problems often associated with other video-conferencing systems (e.g. jerky or frozen

images, or pixilation). Audio was transmitted through ceiling mounted microphones and analog speakers.

For the instant messaging channel, subjects used the MSN Messenger Instant Messaging program. The program provides several multimedia communication features (e.g. personal image icons, audio and video chats, and file sharing), but these were disabled for these experiments. Like most recent IM clients, MSN messenger converts emoticons to graphical icons.

The four conditions were achieved by combining these two channels. The conditions are: 1) both subjects sending messages through IM, 2) the critic sending through videoconferencing and the writer sending through IM, 3) the critic sending through IM and the writer sending through videoconferencing, and 4) both using videoconferencing.

Metrics and Data Collection

Data was collected from three sources: questionnaires, transcripts of the feedback conversation, and analysis of the documents that the writer created. This section describes these data sources in detail, and explains the procedures used to prepare and process the data. Analysis of the data will be discussed in the following section.

Questionnaires

Subjects completed both pre- and post-experiment questionnaires. The pre-questionnaire was designed to elicit demographic information (much of which is presented in the “Participants” section above). Additionally, the pre-questionnaire for the Writers included the Generalized Self-Efficacy Scale (Schwarzer & Jerusalem, 1995).

The post-experiment questionnaire was designed to elicit participants' perceptions of the task and the experiment. For Writers, the questionnaires asked about feedback acceptance, their perception of the Critic's authority and intent, the degree to which they felt motivated by the feedback, and their satisfaction with the feedback. Both subjects were asked about the style of the feedback given or received, their trust in the other participant (Butler, 1991; Johnson-George & Swap, 1982), and their feelings of bonding or closeness with the other participant. In addition, both subjects were asked questions designed to gauge the development of shared meaning. In order to reduce participants' focus on the feedback aspects of the task, a number of dummy questions asked about the case study (e.g., "The problem [at the company] is easy to solve.") or non-relevant personality traits (e.g., "I enjoy discussing politics.").

Conversation Transcripts

Feedback conversations were captured using two methods. The instant messaging software automatically logged all sent messages. These logs were saved in an XML format that included the message, which participant sent and received the message, and the timestamp.

For videoconference conversations, each feedback session was recorded onto DVD. The DVD videos were converted to MPEG-1 files, and transcribed using Transana 2.0 (Woods & Fassnacht, 2005). The transcripts were marked up with a simplified Jeffersonian transcription method (Heritage & Atkinson, 1984). Jefferson provides a very detailed set of transcription symbols for capturing not only the words but also non-linguistic utterances and many of the nuances of human speech (Jefferson, 2004). However, for the level of analysis required here, her set of symbols is much more

detailed than required. Instead, these transcriptions used a reduced set of symbols that allowed representation of noticeable pauses, hushed or particularly loud speech, changes in tone that could indicate questions or sarcasm, laughter, incomplete utterances (stopping or trailing off mid-sentence), and overlapping speech.

For mixed-media conversations, it was necessary to combine the IM transcript with the video transcript. Using Transana, timestamps were added to the video half of the transcript to mark the beginning of each utterance. Because the arrival of the first IM message in a conversation is accompanied by a sound effect, it was possible to match the timestamps of the videoconferencing participant with the timings from the IM history file. This produced a single interleaved transcript for each session.

Segmenting Conversations

Prior to coding the content of the feedback conversations, transcripts were divided into segments at the appropriate granularity. Because the hypotheses mostly refer to the amount and kind of feedback, the choice was made to segment the transcripts at the level of “items of feedback.” In practice, this level of analysis lies between the minute level of coding used in Conversation Analysis and linguistics (ten Have, 1999), and the level of topics or conversational threads (McDaniel, Olson, & Magee, 1996). This level of segmenting was described to coders as: “A segment is a statement or question or set of statements and/or questions that constitute a unit of feedback or a single idea.”

This level of coding was chosen to make it possible to quantify the amount of feedback given, and to analyze the feedback on several other dimensions (described below). Each segment was marked as a continuous block of conversation, although when

| | |
|---------|--|
| CRITIC: | [Yeah. It says each slide should have at least three and no more than ten bullet points so we have to make sure that those options are condensed I guess. |
| WRITER: | Right] |
| CRITIC: | [Like which ones which ones do you think like which reason do you think you're gonna use for the option one? |
| WRITER: | I think I'm gonna say that the main pro of firing him would be safety like overall safety and the main con would be, um, I guess it would be like what you said like not being - not having teamwork. |
| CRITIC: | OK. |
| WRITER: | Like not having teamwork at all.] [And then for the second one I was gonna say the opposite is the best, it's the best option because um, do you think I should say something about like it doesn't like put him on the spot in front of everyone? |
| CRITIC: | Yeah |
| WRITER: | which might make him feel awkward? |
| CRITIC: | Yeah. Definitely.] |

Figure 3: Transcript segmenting example

coded it was possible to indicate that a segment was linked to an earlier statement (for example, due to overlapping conversational threads).

Figure 3 shows an excerpt from a transcript, with square brackets marking the beginnings and ends of segments. Each segment deals with a different item that the Writer could address. The first segment has to do with the number of bullets per slide, the second segment is about the reason for “option one,” and third segment is about the “second one.” Note that it is not necessary for the Critic to initiate a segment, and it is not necessary that a segment begin at a change in speaker.

To develop reliable segmentation, all transcripts were segmented by two people. Training was conducted on pilot transcripts until there was a high level of agreement between the segmenters. Then each person independently segmented the entire set of transcripts. After all of the transcripts were segmented, disagreements were discussed by the segmenters until they agreed on the correct coding.

Because there is no baseline for expected levels of agreement between coders, it is impossible to use a statistic like Cohen's kappa, but it is possible to report agreement as percentages. If we treat each break between segments as a decision point (e.g. the end of one segment is the beginning of the next – this is one break), we can then divide the total number of breaks that both segmenters produced by the total number of breaks in the post-discussion final version. This produces an 84.0% agreement. A more conservative approach includes in the denominator not only the final correct breaks, but all correct and incorrect breaks: this gives 73.0% agreement. Finally, if we choose segments instead of breaks, and divide the number of agreed-upon segments by the total number of correct segments, we have 69.5% agreement.

In textual analysis like this, whether the segmentation holds up during analysis tends to be a better indicator of reliability than simple agreement (Wood & Kroger, 2000). As such, a reliability check was included in subsequent use of the segmented transcripts: coders were asked to flag improperly segmented units as they performed analytic coding. Only 12 of the 651 segments (1.8%) were identified as improperly segmented by either coder, and none of the units were flagged by both coders.

Analytic Coding

After all transcripts had been segmented, each segment was coded on several variables. After the coding categories were developed, two coders coded pilot transcripts in three iterations to both refine the coding scheme and develop high inter-coder reliability. The coders then coded all experimental transcripts individually.

The coding was designed to reveal the amount of conversation in terms of topical units, how the conversation flowed, how much of the conversation was directed feedback, and how the feedback was delivered and received. After all coding was complete, each coding variable was examined for inter-coder agreement using Cohen's kappa. Reliability will be reported with the descriptions of each coding category below. (Landis & Koch, 1977) suggest the following interpretations for values of kappa:

Table 3: Interpretations of kappa (Ladis & Koch, 1977)

| Kappa Statistic | Strength of Agreement |
|------------------------|------------------------------|
| <0.00 | Poor |
| 0.00-0.20 | Slight |
| 0.21-0.40 | Fair |
| 0.41-0.60 | Moderate |
| 0.61-0.80 | Substantial |
| 0.81-1.00 | Almost Perfect |

Because of coder unavailability, it was not possible to reconcile coder differences through discussion. Thus, only one coder's data will be used for the analysis. Also, there were additional coding categories that are not discussed here and will not be included in the analysis due to lack of acceptable reliability.

Segment Type: In order to determine how much feedback was given during each conversation, and what percentage of the conversation consisted of feedback as opposed to social exchanges or other communication, each segment was categorized as:

- [C]onversation management or social exchange
- [T]echnology or experiment comments
- [F]eedback or other task conversation
- [N]onsense utterances or meaningless statements. This category was rarely used (only 6 segments), and typically indicated stretches of “Ums” or statements that were interrupted and never finished.

Segments marked C, T, or N were not coded any further. Feedback segments were further coded as described below.

There was substantial inter-coder agreement about the Segment Type (Cohen’s $\kappa = 0.77$). If we reduce this category to a binary of “Feedback” or “Other,” (by combining C and T into a single code), κ rises to 0.86, suggesting almost perfect agreement about whether a segment was or was not feedback.

Implication: Feedback “sign” (whether feedback is positive or negative) is one of the most important predictors of feedback acceptance, and a key metric for Hypothesis 1. Each segment was coded as:

- [C]hange something (negative feedback)
- [K]eep something (positive feedback)
- [N]eutral: no clear recommendation
- [M]ixed: e.g. “You could change X, or you could keep it the way it is. It’s up to you.”

Reliability for the implication variable was only moderate (Cohen’s $\kappa=0.55$).

There may have been some theoretical overlap between the “Neutral” and “Mixed” codes, but κ only increases to 0.56 if we combine Neutral and Mixed into the same code.

Initiator: If an interactive conversation is marked by equal costs of participation, we should see both participants initiating conversation topics. Feedback conversations will tend toward the critic initiating more topics than the feedback recipient, but here we would still expect that the Writer might have specific concerns to ask about. This code simply tracks which participant initiated each item of feedback. For example, in Figure 3, the third segment is initiated by the Writer rather than the Critic. This coding had substantial reliability (Cohen's kappa = 0.73).

Rationale: The presence of rationales suggests that more information is being shared in the exchanges, indicating a higher level of interactivity. This code is applied if either the Critic or the Writer provide a rationale for the feedback. Reliability was moderate (Cohen's kappa=0.55).

Discussed: The presence of discussion is a key indicator of interactivity. Sometimes, a Critic gives feedback point by point, almost as if reading a list. However, if an item of feedback is discussed by the Critic and Writer (more than a simple "OK" or "Yep."), this code is applied. Reliability for this code was substantial (Cohen's kappa=0.64).

Agreement, Challenge, and Deflection: How the Writer responds to feedback during the conversation could indicate their likelihood of accepting the feedback, or if they are having a strong emotional reaction to the criticism. Each item of feedback was coded for whether the Writer agrees with the feedback, challenges the feedback (expresses disagreement), or attempts to deflect the criticism (e.g., by giving an excuse). Agreement and Deflection produced substantial reliability (Cohen's kappa = 0.71 and

0.68, respectively). The Challenge code could not be reliably coded (Cohen's kappa = 0.41) and is excluded from further analysis.

PowerPoint Document Quality

While the relationship between feedback and quality has been studied extensively, the literature does not contain clear findings in this area. Even so, it is still of interest to know if the quality of the PowerPoint document differs across conditions. By grading the PowerPoint presentations, both before and after the feedback conversation, we are able to calculate the average change in quality for each condition. Additionally, there is reason to believe that the quality of the pre-conversation PowerPoint may influence the quantity and quality of feedback given. Thus, pre-conversation PowerPoint quality will be used as a control in some analyses of the feedback conversation.

To assess PowerPoint quality, a grading scheme was developed based on two distinct methods. First, a set of thirty-six questions were developed based on the instructions given to the subjects (e.g., there should be exactly four slides), on the expert commentary to the case study (Roche et al., 2003), and on general PowerPoint design features (e.g., the text should fit on the slide). Second, four subjective ratings were assigned for the a) content of the recommendations, b) writing and rhetoric, c) format and mechanics, and d) overall. This resulted in a forty-question instrument (see Appendix 11).

Two coders graded sample PowerPoint presentations to develop reliability and consistency in the grading. Once training had been completed, they independently graded all of the presentations. Several steps were taken to minimize bias in the graders. Before grading, all of the PowerPoint presentations were anonymized by replacing the author's

name with a male name from a random name generator (Kleimo, 2006). New filenames were randomly assigned to all PowerPoint files to obscure the experimental condition and whether files were from before or after the feedback conversation. The graders were given a randomly generated list indicating the order in which to grade the files. One of the graders was not familiar with the experimental design. In order to eliminate any expectation that PPT files from the same session would show improvement, she was told that similarities in the files occurred because two subjects had worked as a team, but each had created his own presentation.

Reliability of PowerPoint Grading

All of the categorical grading questions were analyzed for inter-rater reliability using Cohen's kappa. For some questions, the range of possible choices were condensed to enhance agreement. For example, for the question "Are the recommendations consistent with the approaches recommended in the commentaries?" the original options were a) No, b) Some yes, some no, and c) Yes. With all three categories, Cohen's kappa is 0.32. However, in looking at the data, it is obvious that the coders disagreed on where to draw a distinction between "Some yes, some no" and "Yes." After combining these two categories into a single code, Cohen's kappa is 0.77.

Seventeen of the original 36 questions had high enough inter-rater agreement to use in further analysis (Cohen's kappa > .50). These seventeen questions were summed (with value reversals as necessary) to create a final score for each presentation. The scores of the two graders are highly correlated, $r = +.85$, $n = 74$, $p < .001$ (Franzblau, 1958). Among the subjective ratings, only the "Overall" rating had a high enough correlation to be useful, $r = +.67$, $n = 74$, $p < .001$. Finally, there is a high correlation

between the score calculated from the 17 questions and the overall subjective score, $r = +.75$, $n = 148$, $p < .001$.

Feedback Acceptance Coding

It was hoped that the final piece of data would come from comparing the “before” and “after” PowerPoint documents to assess whether Writers incorporated the changes suggested by the Critics. Using the coded feedback conversations, two coders went through all the PowerPoint documents to determine if each item of feedback was heeded by the Writer during editing. Even after significant training and selective recoding, reliability was too low for further analysis (Cohen’s kappa = 0.5).

Further analysis of the coding scheme suggested that an acceptable level of reliability could not be achieved without a complete overhaul of the coding scheme that would have required recoding the entire set of documents. Given these problems, and the lack of support for the feedback acceptance hypotheses in the questionnaire data (described in the next section), the decision was made not to use this coding data.

These coding problems were a significant motivation for the design of the second experiment, described in the next chapter.

Analysis and Findings

First level data analysis was conducted using the same general approach for all variables. The basic experimental design employed a 2x2 manipulation of the Critic’s

communication medium and the Writer's communication medium.¹ Gender was also included in the analysis, resulting in a basic 2 (Critic's Med.) x 2 (Writer's Med.) x 2 (gender) ANOVA design. Other analyses were conducted where relevant. The analyses for each hypothesis are presented in the rest of this section.

Interactivity and Media Conditions

Interactivity results from a set of enacted behaviors within a particular communication environment. The affordances of the communication environment shape the communication behaviors, but these behaviors may also be affected by other factors including the characteristics of the individual participants (and their relationship to each other) and social and genre norms. To address the question of whether the four experimental conditions vary in the level of interactivity, transcript data were analyzed for changes in the amount of communication, communication balance, and the contingent interlocking of communication.

First, the amount of communication was analyzed using counts of the number of conversation segments and of the number of items of feedback presented in each feedback session. Because each feedback session took the same amount of time, this will give a good sense of the amount of information shared.

¹ Throughout this document the phrases "Critic's medium" and "Writer's medium" refer to the medium that each person uses to send information to the other. In other words, if the Critic's medium is videoconferencing and the Writer's medium is IM, then the Writer can see and hear the Critic, but the Writer must type if he wants to ask the Critic a question.

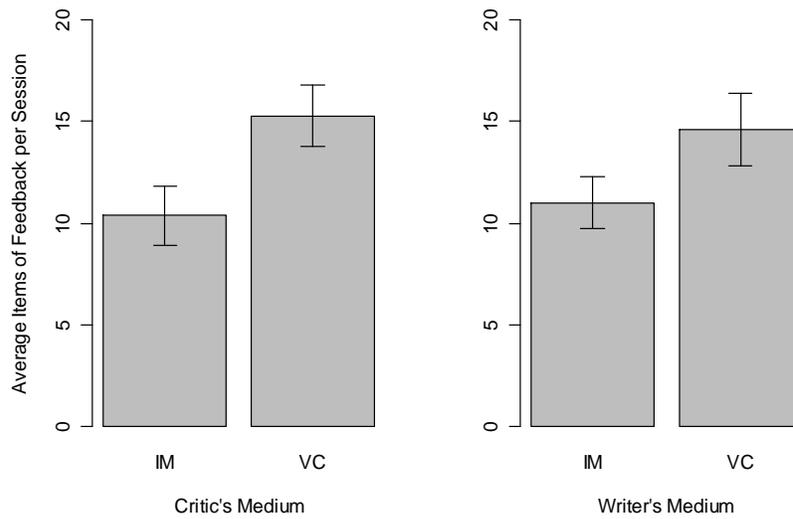


Figure 4: Total items of feedback by Critic's and Writer's media

The Critic's communication medium is a significant determinant of both the number of segments ($F(1,35)=8.8, p<.01$) and the number of items of feedback ($F(1,34)=5.8, p<.05$). The Writer's medium is not a significant predictor of the number of segments, but approaches significance for the number of items of feedback ($F(1,34)=2.9, p<.1$, see Figure 4).

As a second test of the amount of information shared, items of feedback were coded for whether the critic provided a rationale for the feedback. Results showed that the percentage of items of feedback with rationale depended on the Critic's medium ($t(31.9) = -2.7166, p < .05$). Critics are more likely to back up their feedback with rationales if they are communicating through videoconferencing than if they are giving feedback over IM (see Figure 5).

Another key marker of interactivity is interlocked communication. In a feedback conversation, we look for whether the conversation is mostly a series of statements by the Critic, or if the various items of feedback are discussed. Each item of feedback was coded for the presence of discussion (beyond a simple "OK" or "Yes"). We can then look at the percentage of items of feedback that contained back-and-forth discussion.

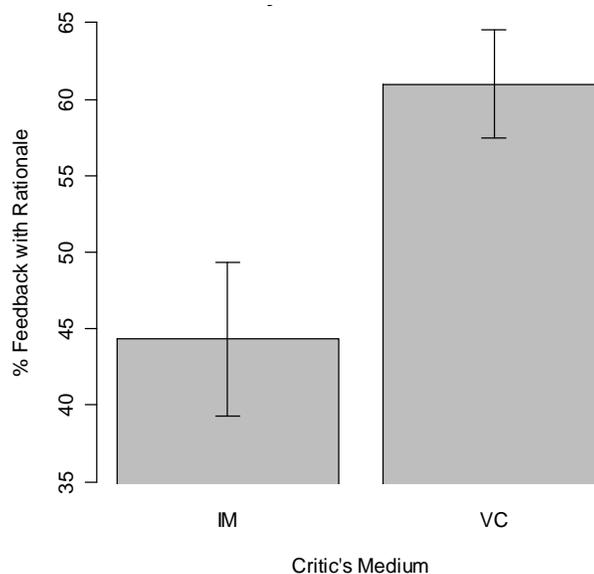


Figure 5: Percent of items of feedback with rationale, by Critic's medium

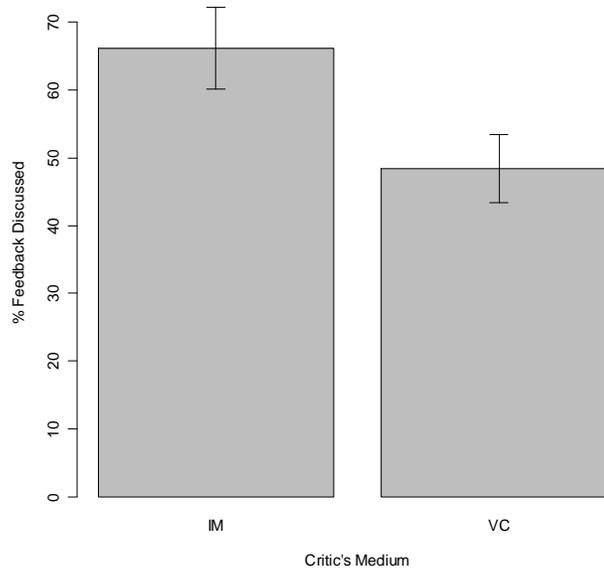


Figure 6: Percent of feedback discussed, by Critic's Medium

The analysis suggests that the Critic's medium is a significant determinant of the amount of discussion ($F(1,35)=5.0731, p<.05$). When the Critic is using instant messaging, a greater percentage of items of feedback will be discussed (see Figure 6). This is a particularly interesting finding because it suggests that the highest levels of interactivity may not actually be achieved in the richest media.

One potential explanation for this is that as a genre, feedback conversations have a built-in power dynamic that can lead to an imbalance in the amount of conversation. There are two distinct roles—the feedback giver and the feedback recipient—and we expect the feedback giver to do most of the talking. A medium like instant messaging, however, tends to have a slower communication speed, and messages sent in discrete chunks (rather than a continuous stream). This provides more opportunities for the Writer to interject in a conversation that we would expect to be relatively one-sided.

Finally, we expect that higher levels of interactivity will show greater balance in participation. Even though typical feedback conversations may not have equal participation by both participants, we expect that less interactive communication environments will show greater imbalance. One way to determine balance is to look at which participant is controlling the direction of the conversation. In a typical feedback conversation, most of the time the Critic will decide which items to address, but the Writer could also introduce topics and ask for feedback in a specific area. In balanced conversations, each participant will introduce an equal number of topics. This was tested by analyzing the percentage of items of feedback initiated by each participant. While these data differ in the expected directions—Writers initiated a greater percentage of the topics when they were in videoconferencing, or when the Critic was using IM—these results do not reach significance.

When we take these results as a whole, the data suggest that interactivity is determined not only by the medium itself but also by the relationships among media and the norms of giving feedback. As such, it is not always clear which condition has the highest interactivity. For each person in the conversation, the number of items of feedback that they contribute depends on the medium that they are using. However, if we look at the amount of discussion, we see that the Writer's behavior (i.e. discussing the feedback) depends on the Critic's medium. The follow-on experiment described in the next chapter attempts to more precisely control the interactivity of each communication medium.

Feedback Content and Style

The first three hypotheses deal with feedback content and style: level of negativity, level of politeness, and development of shared understanding. This section addresses each of these in turn.

Negativity

Feedback “sign” (positive or negative) is one of the most-studied characteristics of feedback. Feedback sign has been shown to be an important predictor of feedback acceptance, and it is related to how feedback recipients perceive the feedback source (Baughman, 1988; Nease et al., 1999; Podsakoff & Farh, 1989; Shao, 1997). Feedback delivered in electronic media tends to be more negative than feedback delivered face-to-face (Hebert & Vorauer, 2003).

Hypothesis 1 states that the level of negativity of the feedback will be inversely related to the interactivity of the communication environment. In other words, feedback delivered in less interactive environments will be more negative.

In this experiment, negativity was measured through subject questionnaires and by coding the conversation transcripts. In the questionnaires, negativity was measured with a set of 3 paired questions for the writer and critic:

Writer:

- The feedback I received was positive. (reverse scored)
- The feedback I received suggested that the PowerPoint presentation needs a lot of improvement.
- The other consultant thought I did a good job. (reverse scored)

Critic:

- The feedback I gave was positive. (reverse scored)

- The feedback I gave suggested that the PowerPoint presentation needs a lot of improvement.
- I thought the other consultant did a good job. (reverse scored)

These questions were analyzed separately and also as an averaged negativity score. Analysis of the Writer's responses and the Critic's responses were conducted both separately and as a per-session average. The only significant determinant of the Writer's perception of negativity is gender, $F(1,34) = 7.6, p < .01$, with men's interpretation of the feedback more negative than women's (see Figure 7).

Neither the media conditions nor gender are significant determinants of the Critics' perceptions of negativity.

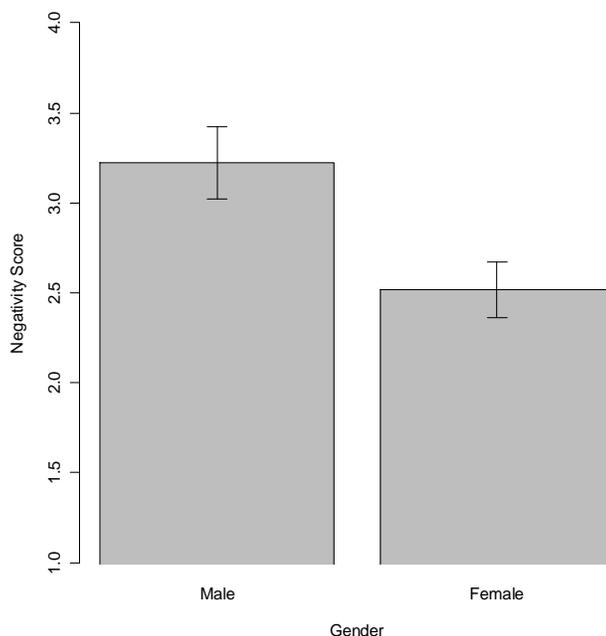


Figure 7: Writer's perception of negativity, by gender

Negativity was also explored through analysis of the conversation transcripts. Feedback items were coded for whether the implication was positive, negative, or neutral/mixed. Analysis was conducted by looking at the percent of the feedback in each

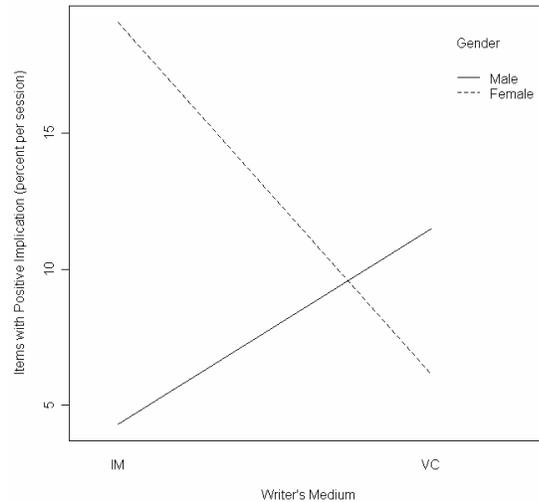


Figure 8: Percent of items of feedback with positive implication - interaction of Writer's medium and gender

of the three coding categories. When interpreting these results, remember that the implication coding category only had moderate inter-coder agreement ($\kappa = .55$).

There is little if any effect from media condition or gender on the amount of mixed or neutral feedback across conditions. However, looking at the results for positive and negative feedback, we can see that the interaction of Writer's medium and gender had a significant effect, consistent across all modes of analyses. For example, looking at the percentage of feedback that was positive, the Writer's medium by gender interaction was significant at the $p < .01$ level ($F(1,33) = 9.6$).

This interaction is interesting because it suggests that men are more likely to give positive feedback when the Writer is using videoconferencing, but women are more likely to give positive feedback when the Writer is using IM (see Figure 8).

Threat Regulation

Our second hypothesis was that the level of threat regulation in a feedback conversation will be positively related to the interactivity of the communication

environment. In other words, Critics will engage in more threat-reducing behaviors when there are higher levels of interactivity.

Threat regulation concerns the degree to which critics attempt to soften the delivery of bad news. For example, they might omit negative comments, try to phrase their comments in less direct language, or use non-verbal communication to soften the impact of a critique.

Threat regulation was measured with a series of six paired questions:

1. The feedback I received/gave was polite.
2. The other consultant tried to protect my feelings./ I tried to protect the other consultant's feelings.
3. The other consultant gave more positive feedback than (s)he thought I deserved./ The feedback I gave was more positive than the other consultant deserved.
4. The other consultant held back some comments to protect my feelings./ I held back some comments to protect the other consultant's feelings.
5. The other consultant could imagine how I was feeling./ I could imagine how the other consultant was feeling.
6. The feedback I received/gave was completely truthful. (Reversed)

For each question, the individual questions for the critic and the writer are analyzed separately, and a difference score is calculated by subtracting the writer's response from the critic's.

Reliability analyses suggest that these questions do not represent a single latent variable for the writers ($\alpha=.424$). For critics, these produce acceptable internal consistency ($\alpha=.621$). It is not surprising that these scales would not hold together particularly well, given that the questions represent different facets of the threat regulation concept, including tone of message delivery, content of messages (e.g. omitting bad news), and ability to empathize.

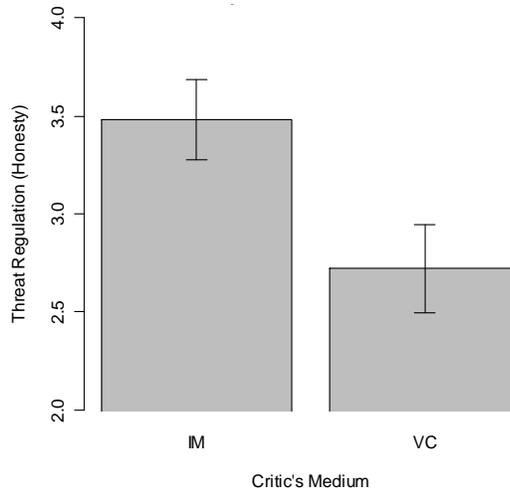


Figure 9: Writer's perception of threat regulation (honesty), by Critic's medium

As a result, a scale was created to measure the honesty of the feedback, using only questions 3, 4, and 6. This scale produced acceptable internal consistency for the writers ($\alpha=.635$), critics ($\alpha=.608$), and difference scores ($\alpha=.702$). ANOVAS for each scale were performed, both with and without gender (see table). Additionally, the writer's scale was reanalyzed with the critic's scale included as a covariate, but this did not qualitatively affect the findings.

The only significant result is that the Writer's perception of threat regulation depends on the Critic's communication medium ($F(1,33)=6.7, p<.05$). This is an interesting result for these data. It appears that the perception of threat reduction through content withholding varies by the medium in which the feedback was communicated, but only for Writers. Writers perceive that Critics are withholding more information when the feedback is communicated through instant messaging than when communicated through videoconferencing (see Figure 9—higher values indicate greater levels of withholding information).

Understanding the thinking of writers when they answered this question is difficult. On one hand, the questions could be construed positively: a higher value could indicate that the critic is trying to protect the writer's feelings. On the other hand, these results also suggest that when writers receive feedback in IM, they are more likely to suspect that the critic is not telling them the whole truth.

The other threat reduction questions that were not included in the honesty scale were also analyzed individually, but produced no significant differences among conditions.

The hypothesis suggested that critic's level of threat regulation would have changed depending on how they saw the writer. If the critic has richer information about how the feedback is affecting the writer's emotional state, it is more likely that they will engage in threat reduction behaviors. The questionnaire data do not support this hypothesis. However, these results could be a result of the difficulty of answering these questions. Critics may not be aware of their own behaviors, especially if the feedback is not overly negative.

Because of the low reliability of the transcript coding for threat regulation, the hypothesis cannot be tested from conversation data.

Shared Understanding and Meta-accuracy

The third hypothesis about feedback content and style suggests that shared understanding will be positively related to the interactivity of the communication environment. In high interactivity environments, participants will be able to come to a more accurate understanding of each other.

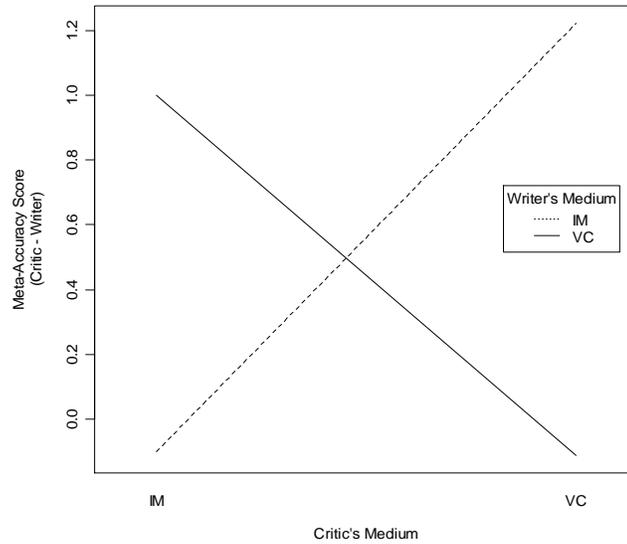


Figure 10: Meta-accuracy, interaction of Critic's medium and Writer's medium

To test shared understanding, twenty-one questions about the task were asked of both the critic and the writer. Difference and the absolute value of the difference between the critics' and writers' responses were calculated for each of these questions. A reliability analysis shows acceptable internal consistency for both scales ($\alpha=.664$, and $\alpha=.606$ respectively). Scales were created by summing the difference scores for all twenty-one variables. The analysis showed no significant differences in shared understanding across conditions, with or without gender.

“Meta-accuracy” is a subset of shared understanding that focuses on the Writers' ability to accurately discern Critics' perceptions of the Writer (Hebert & Vorauer, 2003). In evaluating the PowerPoint presentation, the Critic formed a perception of the Writer's performance. During the feedback conversation, the Writer then formed a meta-perception of the Critic's perception. Meta-accuracy is a measure of agreement between the Critic's perception and the Writer's meta-perception.

Each participant answered a question that specifically addressed the Critic's evaluation of the writer: "[I / The other consultant] thought [the other consultant / I] did a good job." To create a meta-accuracy score, the Writer's rating was subtracted from the Critic's rating. Meta-accuracy was analyzed in a 2 (Critic's medium) by 2 (Writer's medium) by 2 (gender) ANOVA. There was a significant interaction between the Critic's medium and the Writer's medium ($F(1,33)=5.2, p<.05$) with no effect from gender (see Figure 10). In this graph, the higher values indicate that in mixed-media conditions, the Writer interpreted the Critic's evaluation more negatively than intended.

Perceptions of Source Credibility

The next pair of hypotheses have to do with the Writers' perceptions of source credibility. Do the Writers believe that the people giving them feedback are qualified to do so? These two hypotheses refer to the Writers' perceptions; all of the data is drawn from their questionnaire responses.

Trust

Hypothesis 4 says that the recipient's trust in the feedback source will be positively related to the interactivity of the communication environment. Trust was measured with a series of questions drawn from a) the Specific Interpersonal Trust (SIP) Scale (Johnson-George & Swap, 1982) and b) the Conditions of Trust Inventory (Butler, 1991). The questions used are listed in Appendix 8.

The two scales use slightly different operationalizations of the trust concept. To use the Specific Interpersonal Trust Scale, it was necessary to instruct subjects to "imagine that you are going to be interacting with the other subject in the future."

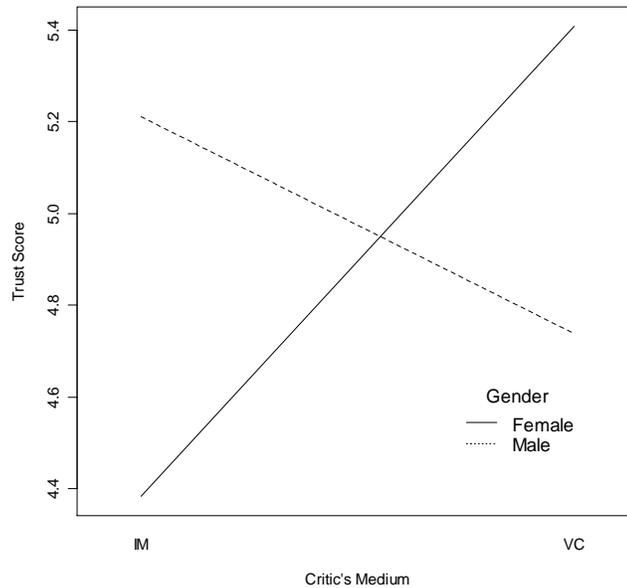


Figure 11: Critic's trust score, interaction of gender and Critic's medium

However, the Conditions of Trust Inventory could be used more directly, as the questions are more direct.

There are a total of 29 trust questions used in this analysis. Five questions were reverse coded. Taken together, the trust questions revealed a high level of internal consistency ($\alpha=.93$). The overall trust score was computed as a mean of the 29 questions.

Writers' and Critics' responses were analyzed separately. For Writers, neither communication condition nor gender were significant predictors of trust. For Critics, there was a significant interaction between the Critic's communication medium and gender, $F(1,33) = 8.2, p < .01$.

To explain this more simply: it appears that female Critics trusted Writers more when they gave feedback in videoconferencing. On the other hand, male Critics trusted Writers more when they gave feedback in IM than in videoconferencing (see Figure 11).

While there is a significant result, interpretation is problematic. In debriefing, several subjects expressed that they had difficulty answering the trust questions because of the limited amount of interaction between participants. Both trust scales, and especially the SIP scale, tend to assume longer acquaintance and better interpersonal knowledge. It is also not clear why this result would be significant for Critics, but not for Writers.

Mutuality

The second source credibility hypothesis has to do with mutuality—that participants’ feelings of mutuality will be positively related to the interactivity of the communication environment.

Mutuality refers to the general perception that subjects are “in this together.” Related concepts include shared goals, common ground (Olson & Olson, 2000), and relational closeness (Aron & Fraley, 1999). The mutuality scale developed here employs six questions. One question is the “Inclusion of the Other in the Self” diagram from (Aron, Aron, & Smollan, 1992). This diagram is composed of seven pairs of circles with increasing levels of overlap, and subjects are asked to circle the picture which best describes their relationship with a target person (in this case, the other subject). The other five questions ask the subject to indicate their level of agreement with these statements:

- The other consultant and I make a good team.
- The other consultant and I share many interests.
- The other consultant understands how I was thinking.
- The other consultant and I agreed about the goals of the exercise.
- The other consultant and I are more similar than we are different.

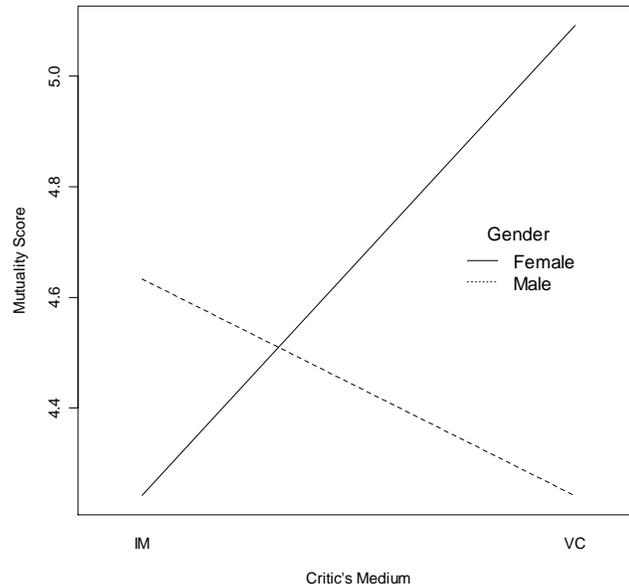


Figure 12: Critic's mutuality score, interaction of gender and Critic's medium

A reliability analysis revealed a high level of internal consistency ($\alpha=.801$). The overall mutuality score was computed as a mean of the 6 questions.

As with trust, Writers and Critics were analyzed separately. And similarly, mutuality was determined by a significant interaction between the Critic's medium and gender for Critics, $F(1,33), p<.001$ (see Figure 12). The same interaction was nearly significant for Writers, $F(1,33), p<.1$.

Again, this finding should be interpreted carefully. As with the trust scores, it is not clear why this effect would be significant for Critics, but not significant for Writers. There may also be theoretical overlap between mutuality and trust such that these two analyses are capturing variance from the same latent variable.

Feedback Acceptance and Response

The final two hypotheses have to do with how the Writer responds to feedback. As mentioned earlier, it was hoped that feedback acceptance data could be gathered from the transcripts, but problems with coding scheme reliability prevent this. As such, these final hypotheses will be tested using primarily the Writers' questionnaire data.

Hypothesis 6 claimed that feedback acceptance would be positively related to the interactivity of the communication environment. Feedback acceptance measures the degree to which writers believe the feedback they are given. It was measured by a set of six questions:

- It is hard to take the comments that I was given seriously. (Reversed)
- I found the feedback I received to be useful.
- I believe the feedback I received.
- I incorporated all the other consultant's suggestions into my PowerPoint presentation.
- I do not agree with the feedback provided by the other consultant. (Reversed)
- The feedback I received was completely truthful.

The analysis was complimented by a question addressing the Writers' feelings of motivation:

- The other consultant motivated me to do my best work.

However, neither the communication environments nor gender were found to be significant determinants of feedback acceptance or motivation.

The data for satisfaction are more intriguing. Hypothesis 7 suggests that recipients' satisfaction with feedback will be positively related to the interactivity of the communication environment. Satisfaction was measured with two questions:

- I am satisfied with the feedback I received/gave.

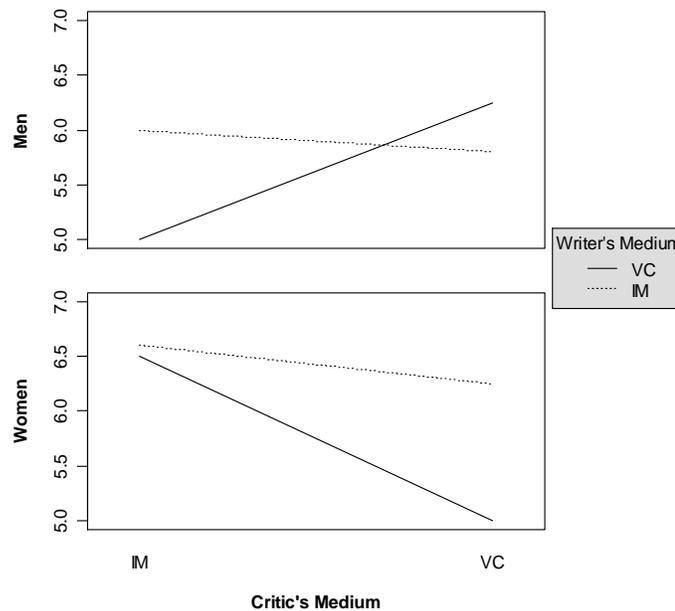


Figure 13: Writer's satisfaction with the feedback experience

- Overall, receiving/giving feedback was a satisfying experience.

The Critics' and the Writers' responses were analyzed separately. Not surprisingly, Critics found it more satisfying to give feedback over videoconferencing than over IM ($t(33) = -2.8, p < .01$, two-tailed).

The situation is slightly more complex for Writers (see Figure 13). For the first question—satisfaction with the feedback—there are no significant effects. However, for the second question—about satisfaction with the “experience”—there is a significant interaction between the Critic's medium, the Writer's medium, and gender ($F(1,29)=6.1, p < .05$).

For both men and women, when the Writer is using instant messaging, there is little change in the Writer's satisfaction with the experience regardless of the Critic's medium. However, when the Writer is using videoconferencing, men are more satisfied if

the Critic is in the same medium, whereas women are more satisfied if the Critic is using instant messaging.

One aspect of the transcript coding that pertains to Writers' response to the feedback they receive is how they respond to the feedback during the conversation. Feedback conversations were coded for whether or not the writer expressed agreement with the critic, and whether or not the writer deflected the feedback. Deflections are defined as statements in which the writer makes an excuse or distances herself from her work, for example, by saying "I didn't have enough time for that." Deflections do not indicate disagreement with the feedback, only that the writer felt it necessary to explain why they did what they did. Feedback was also coded for whether or not the writer challenged the feedback, but inter-coder reliability was too low to use this variable.

However, the data show no significant differences in expressed agreement or deflections for media, gender, or experimental condition.

Finally, one might expect that if Writers accept and use the feedback, the quality of their documents might improve. However, neither post-experiment grades nor grade improvement (post-test minus pre-test grades) showed any significant differences on any independent variable.

Table 4: Summary of experiment 1 findings

| Category | Hypothesis | Significant Effects | Notes |
|----------------------------|--------------------------|--|---|
| Content & Style | H1: Negativity | Gender** (perception); interaction of Writer's medium and gender** | Men perceive feedback to be more negative than women; Men give more positive feedback when Writer is in VC, Women give more positive feedback when Writer in IM |
| | H2: Threat Regulation | Critic's medium* | Writer perceives greater withholding by Critic when Critic uses IM |
| | H3: Shared Understanding | Critic's medium by Writer's medium interaction* (meta-accuracy) | Writer's perceive feedback more negatively than intended in mixed-media conditions |
| Source Credibility | H4: Trust | Gender by Critic's medium interaction** (for Critics only) | female Critics trusted Writers more when they gave feedback in VC; male Critics trusted Writers more when they gave feedback in IM |
| | H5: Mutuality | Gender by Critic's medium interaction for Critics***and nearing significance for Writers+ | for women, trust is higher when Critic is using VC; for men, trust is higher when Critic is using IM |
| Response | H6: Acceptance | No significant effects | |
| | H7: Satisfaction | Critic's medium (for Critics)**; Critic's medium by Writer's medium by Gender interaction (for Writers)* | Critics find it more satisfying to give feedback over VC; complex interaction determines Writers' satisfaction |

** p<.01; * p<.05; + p<.1

Summary and Moving Forward

Overall, this experiment presents no convincing support for the theory that communication environment interactivity affects feedback processes or outcomes. While there are some intriguing significant effects in the analysis, these results are not consistent enough to suggest a robust theory. One consistent result from this experiment is that gender plays an important role in this area. We see main effects of gender on negativity, and interactions between gender and media conditions in negativity, trust, mutuality, and satisfaction.

For Critics, both trust and mutuality are determined by an interaction of the Critic's medium and gender. However, in our theoretical approach to feedback acceptance and response, our interest lies mostly with the Writers' perceptions of the Critics. If a Writer trusts a Critic, and believes that the Critic shares the same goals and has the Writer's best interests at heart, the Writer should be more likely to accept feedback. These significant effects, however, pertain only to the Critic's feelings toward the Writer.

On the whole, it is not clear whether the lack of consistent and significant findings is due to theoretical or methodological problems. For example, in the experiment, the four conditions did not have a consistent pattern of variation in the different facets of interactivity. While the Critics tended to share more information in videoconferencing than in instant messaging, this also produced less discussion.

Several of the variables of interest were also problematic. Several coding categories suffered from unacceptably low reliability. Most critically, the feedback

acceptance coding was not usable. These coding problems leave us with few behavioral measures to complement the perceptual measures.

As such, this experiment does not provide enough information to confidently accept or reject the interactivity construct.

A second experiment was planned to deal with some of these issues. While the second experiment will not have as broad a scope as this one, it will hopefully provide clearer data about feedback acceptance. The experiment is designed specifically to control some of the external sources of variance (like gender) while providing a less error-prone method of measuring behavioral effects. This follow-on experiment will be presented in the next chapter.

CHAPTER 4

EXPERIMENT 2

Introduction & Hypotheses

As discussed at the end of the last chapter, the first experiment produced inconclusive results. While the experiment did not provide evidence of interactivity's effects on feedback processes or outcomes, it also did not convincingly rule out interactivity effects. There were enough problems in the experimental method and data to motivate a second experiment to obtain more conclusive results.

Like the first experiment, participants in this experiment received feedback about a document that they had written. The feedback was delivered in one of four mediated communication environments that use videoconferencing and instant messaging (IM). In two conditions, the Critic and Writer each used the same technology to communicate, and in two conditions they communicated in a mixed-media environment. Data were collected from questionnaires and analysis of the documents that the subjects produce. Several changes were introduced to the experimental method—they are described in detail below.

The first experiment's design contributed to the difficulty in coding, and created substantial uncontrolled variance. Experimental subjects were used for both the Writer and Critic role. This provided greater realism in the experiment, and allowed us to ask

questions about how the media affect both the Writer role and the Critic role. But not only did each Writer produce a completely different document, each Critic also gave very different feedback. While some Critics made only a few vague comments about fonts and colors, others gave very detailed instructions to change the entire argument in the document. It was clear that the feedback varied greatly in terms of specificity of the comments, how difficult it would be to implement, and how difficult it would be for the Writer to accept (either because they represented a different approach to the problem, or the suggestions were unworkable or just plain wrong).

The difficulty of implementing reliable coding schemes for behavioral data was a concern in the first experiment. For example, to extract data about feedback acceptance required segmenting feedback transcripts into appropriate “item of feedback” units, coding each of those units for intent, and then comparing the Writer’s pre- and post-editing documents to determine if each item of feedback was heeded. Even with iterative development of the coding schemes and extensive coder training, the data were not reliable enough to be useful.

The analyses of the first experiment’s data also showed that gender was a significant factor for several variables, including negativity, trust, mutuality, and satisfaction. In fact, gender often created an interaction with the variables of interest, such that men and women would not respond in the same way. While these gender interactions are interesting, the additional variance could be masking the main effects of the communication medium.

A final issue raised in the first experiment was ranking the four media conditions in terms of interactivity. It appeared that while each individual’s medium affected the

amount of information delivered, it was the relationship among the media and the feedback norms that determined conversational balance. As such, we could not simply rank the four media conditions by their level of interactivity.

This chapter presents the results of a follow-on experiment designed to directly address these issues through three key innovations: a) it will use uniform feedback for all Writers delivered by a confederate, b) coding will use a single-step process with fewer subjective metrics, and c) the experiment will use only male subjects. The experiment will also make some small changes to the protocols in order to address minor procedural issues in the first experiment.

Giving all subjects the same feedback removes a great deal of the variance in the feedback conversations that is not due to the media conditions. Additionally, this gives the ability to craft feedback that is both clearly defined and easy to detect, greatly simplifying the coding process. And the amount of feedback information will be the same regardless of condition, which allows a focus on the conversational balance aspect of interactivity.

While these changes should produce higher quality data, there are some drawbacks. The scope of the experiment will be narrower. Because of the confederate in the Critic role, the hypotheses will only address changes in the Writer's response to feedback. Providing feedback that can be applicable to any potential document that the Writers create will also present a challenge. The development of this feedback will be described later in this chapter.

Also, because of the use of a confederate, contingency in the feedback conversations will be limited. To develop true double interacts in conversation—that is,

interlocked and contingent interaction—each participant must be able to react to what the other participant has previously said. Using scripted feedback restricts the Critic’s ability to change what he says or the way he says it. The focus must necessarily shift to issues of participation and balance, rather than how the Critic’s feedback can change *in response to* the Writer’s actions.

While the first experiment raised interesting questions about the role of gender in mediated feedback, we will not be able to further investigate those results in this experiment. The main purpose of this experiment is to determine if the media affect feedback acceptance, and as such this experiment will remove gender from consideration.

This experiment will only test hypotheses about the Writers’ perceptions of and responses to feedback. However, the hypotheses will not vary significantly from the first experiment. The hypotheses will be summarized in the next sections.

Perceptions of Feedback Content and Style

In the first experiment, we looked at how interactivity might affect the way that Critics deliver feedback in different media environments. In this experiment, because the Critic is giving the same feedback to all Writers, we are able to specifically look at whether interactivity affects the Writers’ perceptions of the feedback messages. Specifically, we will look at the Writer’s perceptions of negativity and threat regulation.

Hypothesis 1: *The Writer’s perceptions of the negativity of the feedback will be inversely related to the interactivity of the communication environment.*

Hypothesis 2: *The Writer’s perceptions of the threat regulation of the feedback will be positively related to the interactivity of the communication environment.*

Perceptions of Source Credibility

While the use of a confederate in the Critic role should minimize variations in the amount of feedback given, the different media conditions will still affect what the Writer can know about the Critic. When the Writer can see and hear the Critic instead of just receiving their text messages, the visual and audio cues will give the Writer a better sense of the Critic. In addition, conditions that allow the Writer to ask questions of the Critic are more likely to produce feelings of trust and mutuality.

***Hypothesis 3:** The recipient's trust in the feedback source will be positively related to the interactivity of the communication environment.*

***Hypothesis 4:** The recipient's perception of the Critic's expertise will be positively related to the interactivity of the communication environment.*

***Hypothesis 5:** The recipient's feelings of mutuality will be positively related to the interactivity of the communication environment.*

Feedback Acceptance

In addition to the feedback recipient's feelings of trust and mutuality, interactivity is likely to affect other processes as well. Higher levels of interactivity will aid comprehension and sensemaking. Conversational balance, in particular, will help recipients feel like they have been a part of the conversation and have been able to voice their own questions and concerns. As a result, feedback acceptance will be higher.

***Hypothesis 6:** Feedback acceptance will be positively related to the interactivity of the communication environment.*

Method

This experiment follows the same basic procedure as the first experiment (presented in Chapter 3). A Writer creates a document based on a business case study.

The Writer then receives feedback on that document in one of four communication conditions. Finally, the Writer has a chance to edit the document based on the feedback they received before submitting a final version.

There are, however, several important changes in this experiment. The most important of these is that the Critic role is played by a confederate. While the Critic is described to the Writer as “another study participant,” in reality the Critic is an actor who gives the same feedback to every subject. This second experiment also only uses male participants. These and other changes are described in the remainder of this section.

Participants

Participants were recruited through a general subject pool, recruitment posters, and a newspaper advertisement at a large Midwestern university. The pool was the same pool used for the first experiment. However, because individuals who participated in the first experiment were excluded from this experiment, the pool was not able to provide enough subjects, and additional recruiting was conducted.

The first experiment demonstrated that gender produced significant interactions with media effects in several of our target variables. Analysis of the data from the first experiment showed that while the differences were not significant, men tended to have slightly lower unexplained variance than women. As a result, the choice was made to use only male subjects for this experiment.

Forty-one sessions were conducted. Table 1 details how many sessions were conducted in each experimental condition.

Table 5: Sessions in each experimental condition

| | | Critic (sending) | |
|-------------------------|--------------------------|--------------------------|--------------------------|
| | | Instant Messaging | Videoconferencing |
| Writer (sending) | Instant Messaging | 11 subjects | 10 subjects |
| | Videoconferencing | 10 subjects | 10 subjects |

There were a total of 43 male participants who began the study, but two subjects did not return to complete the second session. These subjects are not included in the table above. No other sessions have been excluded from analysis.

The average participant age was 26 years (median 23 years), ranging from 19 to 52 years. Twenty-four subjects (59%) were White, three (7%) were Black or African-American, nine (22%) were Asian, three (7%) were Hispanic or Latino, one was Native-American, and one participant declined to answer.

The highest level of education was a high school diploma for 25 subjects (all but 2 were current college students), an undergraduate degree for 11 subjects, and a graduate degree for 4 subjects (one subject declined to answer).

All subjects reported using e-mail daily. Most of the subjects (66%) had no experience with videoconferencing, although 2 subjects reported using it weekly. Half of the subjects (20/41) reported daily instant messaging use, and 2 reported having never used it. One subject reported never using word processing, two reported using it monthly, and all other subjects use it at least once per week.

Task/Procedure

Each participant in this experiment was signed up for two sessions. In the first session, a group of three to ten subjects entered the laboratory, and each participant was seated in front of a laptop computer at a large table. After reading and signing consent

forms, subjects completed a pre-experiment questionnaire covering demographics and computer use.

Each participant was given instructions and a copy of the business case study, “Do Something, He’s About to Snap” (the same case study used in the first experiment). The Writer was told that after reading the case study, he should create an essay as if he was taking a class in a business school. The instructions provided guidelines for the essay, and also explained that the essays would be graded so that high scoring presentations could earn a monetary bonus. Writers were instructed not to speak to each other, and given up to one hour to complete the essays. After the Writer completed the essay, the experimenter collected the documents and confirmed the Writer’s appointment for the second session the next day.

When each participant arrived for the second session, he was seated at a cubicle, and given a paper copy of his essay. After reading the essay, each participant completed a short self-evaluation questionnaire. Then the participant was given an instruction sheet that told them they would be receiving feedback from another participant who had read their essay. The instructions also told them that they would have a chance to edit the essay after the feedback, and reminded them about the monetary bonus.

Each participant was then led into another room where the communication equipment had been set up. The experimenter made several comments designed to reinforce the deception that the confederate was another participant. For example, the experimenter would say, “The experimenter at the other building should have the other participant ready,” and, “The other participant read your essay, and he got the same instructions as you.” The experimenter then activated the communication media,

confirmed that it was working (by watching the first communications), and then left the room. Rather than giving a time limit for these sessions, the confederate was able to signal to the experimenter through a separate IM channel when all of the scripted feedback had been delivered. The experimenter would then return to the participant's room, saying, "Time's up!" as the door was opened.

The Writer was led back to his cubicle, where a copy of his essay was now open in Microsoft Word. He was given "as long as needed" to edit the document before submitting the final version. All participants took less than thirty minutes to edit their presentation. When done editing, the participant completed a post-experiment questionnaire about the experience of receiving feedback and their perceptions of the task and the "other participant." Finally, subjects were debriefed about the full purpose of the study and the nature of the deception, asked not to reveal the details to anyone else, and compensated for their time (with the full bonus).

Media conditions

The feedback conversations between the critic and writer used essentially the same four electronically mediated communication conditions as the first experiment. The four conditions use either video-conferencing and text-based instant messaging (IM).

The video-conferencing channel was changed slightly to deal with some issues in the first experiment and with the design of the second experiment. In the first experiment, the video-conferencing channel used analog television and audio signals. However, this required precise calibration of the audio channels in the video-to-video condition to allow the participants to hear each other without generating audio feedback.

Additionally, in the first experiment the entire experiment was conducted in one laboratory that included multiple rooms and a central control room for switching, monitoring, and recording A/V signals. In the second experiment, in order to preserve the illusion that the confederate was a participant, it was necessary to isolate the confederate in a different building.

To deal with these requirements, this experiment used a commercial IP-based videoconferencing system. The end points were Polycom ViewStations attached to large monitors. The ViewStation allows high quality point-to-point video- and audio-conferencing with built-in echo cancellation. Both the participant and the confederate were located in buildings on a university campus with robust high-speed networking. This allowed for high quality video and audio, with little or no noticeable delay.

As in the first experiment, the subjects used MSN Messenger for the instant messaging channel.

This experiment used the same combination of the two communication channels as the first experiment. The conditions are: 1) both subjects sending messages through IM, 2) the critic sending through videoconferencing and the writer sending through IM, 3) the critic sending through IM and the writer sending through videoconferencing, and 4) both using videoconferencing.

Uniform Feedback and Confederate Training

A key aspect of the design of this experiment was giving all subjects the same feedback. This section details how the feedback was developed, confederate training, and other measures taken to ensure that the feedback was consistent

Feedback Development

To develop the uniform feedback for the second experiment, a list of all feedback given in the first experiment was generated from the transcripts. Items were also generated from the study guide that came with the case study (subjects never saw the study guide). Items were modified (if necessary) to make them work for the new document format (Word instead of PowerPoint). In order for the feedback to be uniform for all subjects, it was necessary to delete or modify items that would not apply to most or all of the subjects' documents. Any feedback categories that would be impossible to reliably code in the edited documents were removed from the list. I finally removed or combined redundant items (either redundant in the sense of almost the same feedback, or at the same level of specificity and impact).

This process resulted in a set of six items of feedback. The items are listed in Table 6. Some items had alternate versions that could be used in case the participant had already done something in their document. For example, if a subject had already suggested firing Nicole, the feedback would be switched to consider firing Lynne (another employee in the case study). The fourth item suggested making the document either single- or double-spaced, depending on the original document's format. Item 5 could be either "add" or "remove" subject headings, and item 6 could be either "first" or "last" paragraph.

Let me be more specific about how an item of feedback was delivered. For example, the first item was "Consider firing Nicole." The writer's instruction sheet said that he should list all of the potential solutions even if he did not recommend them. In the feedback session, the Critic said:

You should include firing Nicole as one of the options to solve the problems, even if you don't make it one of your final recommendations. She seems like a big part of the problem at [the company in the case study].

This should have created a somewhat difficult decision for the writer: even though the critic told the writer to include this option, in the case study Nicole (and similarly Lynne) was not the instigator of the problems, and it was unlikely that firing her would solve any problems.

The set of 6 feedback items varies intentionally on 3 dimensions: specificity of the feedback, difficulty of the decision to accept, and amount of work necessary to implement.

Table 6: Uniform Items of Feedback

| | Specificity | Difficulty to Accept | Amount of Work |
|--|--------------------|-----------------------------|-----------------------|
| 1. Consider firing Nicole (alternative: fire Lynne) | High | High | Med |
| 2. Recommend an "Employee Assistance Program or EAP" | High | Med | Low |
| 3. Make document less wordy/more concise | Low | Medium | High |
| 4. Change line spacing (single/double) | High | Low | Low |
| 5. Add section headings (alternative: Remove headings) | Medium | Low | Medium |
| 6. Mention productivity in 1st paragraph (alternative: last paragraph) | High | Medium | Low |

These variations should provide a more continuous distribution of acceptance scores. Because changing the line spacing is very specific, easy to do, and not hard to

accept, almost all subjects should make the change. However, the items that are less specific, more difficult to accept, and harder to implement test the limits of the critic's influence, and do so in slightly different ways. The set of items of feedback was kept intentionally short so that running out of editing time would not be a reason for non-acceptance.

Each participant was scheduled for two sessions on consecutive days. In the first session, subjects would write the essay. The subjects would not receive feedback and edit the essay until the following day. This gave the experimenter time to prepare the feedback script for each participant. These scripts all took the same format, with the feedback presented in the same order. The first item in the script was to compliment each participant on something that they did that was individual to their essay, but not related to the feedback that would be given. Examples include:

- “I like that you pointed out that the recession is creating stress and tension in the office. That seems like a key factor.”
- “I like the way you focus on the importance of the feeling of safety at the company. The employees shouldn't have to feel like they're in danger.”

Where possible, the compliments used a direct quote from the Writer's essay (e.g. “the recession is creating stress and tension”). While the rest of each script included the items of feedback and the rationales that were to be given, it was meant to be used as a loose guide for the conversation, rather than to be delivered word-for-word.

The Confederate

In order for the experiment to succeed, the confederate needed to achieve two goals: deliver all of the feedback in the same way to all of the participants, and not be

detected as a confederate. This section outlines the steps taken to choose and train the confederate.

The confederate was a senior male undergraduate theater major from a large university with a prestigious theater department. He had appeared in a number of amateur, university, and professional productions. He had also participated in psychology experiments and taken undergraduate psychology courses, and was familiar with the general framework of laboratory experiments.

In order to maintain the confederate's neutrality, he was told as little as possible about the aims of the experiment. He knew that he would be giving feedback over either instant messaging or video-conferencing, but he did not know the hypotheses or metrics that would be used. Additionally, the confederate never saw the subjects' essays. He worked only from the scripts provided by the experimenter.

The confederate was instructed that his goal was to give the same feedback in an equally convincing manner to every subject, regardless of the medium in which he was communicating. He was also told that he must always maintain his persona as another randomly selected participant in the study. He was not to elaborate on the items of feedback beyond what was included in the script, but he could engage in (though not initiate) normal conversation with the other participant, and could respond to non-task questions asked by the Writers.

I rehearsed with the confederate several times in both mediums before working with any subjects. In these sessions, I helped the confederate achieve an appropriate tone and weight for the feedback. We also worked to develop a set of “non-response responses”—essentially statements that seemed like responses to direct questions, but

provided little or no extra information. For example, if asked a direct question about which option would be better, the confederate could say, “You could go either way with that.”

The confederate took part in all of the pilot testing. After each pilot subject, the confederate’s performance was analyzed and notes were provided about how to adjust the performance.

In order to motivate the confederate to give consistent performances, he was told that he would receive a \$50 bonus if he stayed on script more than 95% of the time, no more than 5% of the subjects mentioned in debriefing that they suspected he was a confederate (only one subject did, and his results do not appear to be outliers), and the influence ratings showed no significant differences across conditions.

To check the confederate’s uniformity, performances were analyzed by independent coders. Three coders analyzed every performance, and three additional coders analyzed a subset of ten performances. Before beginning coding, each coder watched ten random performances in order to establish a baseline. The coders checked that each item of feedback was given correctly and in the correct order. Each coder then indicated whether they felt the performance was “less persuasive than average,” “average,” or “more persuasive than average.” Coders were also asked to explain any item that was marked more or less persuasive, or any other anomalies in the performances. Analysis of the coding suggests that the confederate gave the correct feedback to all subjects, and the level of influence of his performance did not significantly vary across conditions.

Metrics and Data Collection

Like the first experiment, data came from both questionnaires and analysis of the Writers' behavior. However, the reduced scope and altered method for this experiment led to slightly different procedures for data collection.

Questionnaires

Before beginning the task in the first session, subjects completed questionnaire covering demographics and computer use. This was the nearly the same questionnaire as used in the first experiment, except that the self-efficacy inventory was revised and administered at a different point in the experiment.

Self-efficacy was to be used as a covariate in several analyses in the first experiment, but in the end, the data were not useful. The first experiment used the Generalized Self-Efficacy Scale (Schwarzer & Jerusalem, 1995). The literature on feedback has consistently found that self-efficacy is a strong predictor of response to feedback, the logic being that if someone believes he will perform well, he will be less likely to heed negative feedback (and vice versa) (Nease et al., 1999; Waldersee, 1994). For this to hold true, there must be a correlation between the subjects general self-efficacy, and their actual self-perceptions of task performance. In the first experiment, however, subjects rated their efficacy before knowing anything about the task that they were to complete. Additionally, while the efficacy scale is very broad, the task is quite focused. It could be the case that someone with a high general self-efficacy feels quite differently about their ability to create a PowerPoint presentation responding to a business problem.

Even so, given the strong findings in the feedback literature, it was felt that data about the Writers' self perceptions should be collected. The decision was made to develop a new task-specific metric that, while perhaps not a true self-efficacy scale, is more attuned to the underlying logic of the findings in the feedback literature. At the beginning of the second session, Writers were asked to re-read the essay they had written the previous day. A questionnaire was then administered asking them to evaluate their own writing in the essay. The questionnaire included four Likert-scale items (e.g. "The essay is as good as it could be."), one question asking Writers to predict the bonus they would receive for the essay, and one free-response question asking them, "If you were able to edit the essay before submitting it, how much time would you spend working on it?" Unlike the general self-efficacy scale used in the first experiment, these questions apply specifically to the task at hand.

To create a task-specific efficacy score, each Likert-scale question was treated as a continuous variable. The Writer's response was divided by the number of possible responses to give a value of zero to one for each question. The final question (amount of time to edit) was dropped due to low internal consistency. The remaining five questions show acceptable internal consistency ($\alpha=.70$) and were summed to create the efficacy score.

Finally, after participants had received feedback and edited their documents, they completed a final questionnaire asking them about their perceptions of the task and experiment. Several questions were modified or removed based on the results of the first experiment. For example, the Specific Interpersonal Trust Scale (Johnson-George &

Swap, 1982) was not used, and some of the less relevant questions from the Conditions of Trust Inventory (Butler, 1991) were dropped.

Acceptance Data

The use of uniform feedback in this experiment greatly simplified the acquisition of acceptance data. In essence, coding conversation transcripts was eliminated, as the items of feedback were pre-determined. Additionally, the feedback was designed not only to be uniform, but also so that document changes could be easily detected.

For all but the instruction to make the document more concise, determining acceptance was simply a matter of comparing each Writer's "before" and "after" documents to determine if the change had been made. Each item of feedback counted for one point, with zero indicating rejection, and one indicating full acceptance. Participants could get partial points for some items of feedback.

For example, the item to fire Nicole was phrased:

Consider firing Nicole. She seems like as much of a problem as Max. I don't know if you want to make that your final recommendation to fire her, but I think you should at least bring it up as an option and talk about it a little.

In the coding, this was split into two potential items of acceptance, one half point for simply mentioning firing Nicole, and another half point for providing a rationale for firing her.

The second item (to recommend an "Employee Assistance Program") and the last item (to mention productivity in the first paragraph) required subjects to use the specific word or phrase. The items to change the line spacing and add/remove section headings are obvious.

The most complicated item to code was the third:

In general, I think the document needs to be more concise. It's not so much that it's really long, but just that your sentences are pretty wordy and should be more direct. Look for places where you can remove unnecessary words.

Microsoft Word includes a facility for comparing two documents and displaying all of the changes that have been made between versions. This item was coded by counting the number of sentences in which one or more edits resulted in fewer words in that sentence. For example, if the Writer deleted adjectives or other words from a sentence, it was considered as acceptance. However, if he replaced a three-word phrase with four words, the sentence was not counted. Each sentence could only be counted once, regardless of how many words (or even the whole sentence) were removed.

The number of shortened sentences across all participants ranged from zero to eleven. To compensate for an uneven distribution, this range was divided into quartiles and an appropriate portion of a point was assigned.

Finally, the points for all the items were summed, resulting in an acceptance score ranging from zero to six points.

Analysis and Findings

The analysis in this experiment was very similar to that of the first experiment, except that gender was no longer a factor. First level analysis used a 2 (Critic's Medium) x 2 (Writer's Medium) ANOVA design. Other analyses (e.g. including efficacy scores as a covariate) were conducted where appropriate, and are described below.

Uniform Feedback Alternates

A necessary aspect of giving uniform feedback was that some of the items of feedback had alternate forms of the feedback in case the original feedback did not apply to a participant's essay. Table 7 details how many participants received each form of feedback.

T-tests show that none of the differences in acceptance scores between the primary and alternate acceptance rates are significant.

Table 7: Number of participants receiving each form of feedback

| | |
|--|---|
| 1. Consider firing Nicole (alternative: fire Lynne) | Nicole: 36 participants Lynne: 5 participants |
| 4. Change spacing (single/double) | Single: 7 participants Double: 34 participants |
| 5. Add section headings (alternative: Remove headings) | Add: 39 participants Remove: 2 participants |
| 6. Mention productivity in 1st paragraph (alternative: last paragraph) | First paragraph: 30 participants Last paragraph: 11 participants |

Perceptions of Feedback Content and Style

The first two hypotheses have to do with the effects of interactivity on how the Writer interprets the feedback that he receives. Because each Writer gets the same feedback and individual differences should be randomly distributed across conditions, variations in the interpretation of the feedback likely result from changes in the communication environment.

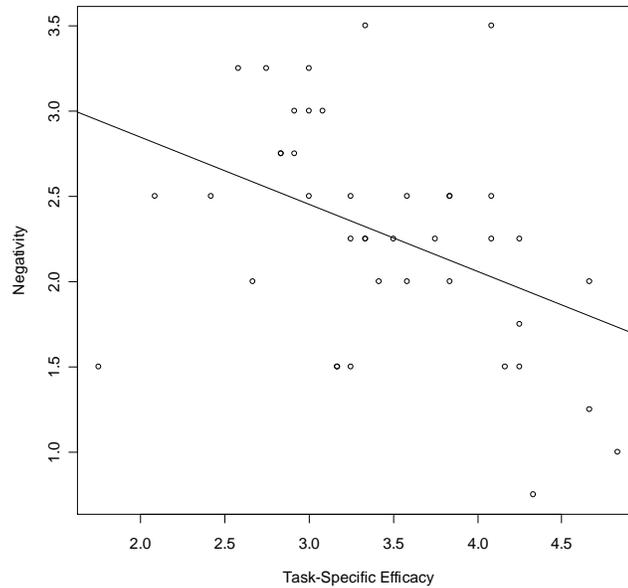


Figure 14: Writer’s self-evaluation predicts perceptions of feedback negativity

The first hypothesis looks at perceptions of negativity in the feedback. Writer’s were asked in three questions to rate the negativity of the feedback they received. These three questions show marginal internal consistency, $\alpha=.68$, so results should be interpreted with caution.

Analysis of the data shows that Writer’s own sense of how well they did is a significant predictor ($p<.01$) of their sense of the Critic’s level of negativity (see Figure 14). As such, efficacy is included as a covariate in this analysis.

The data show that the Critic’s medium significantly affects the Writer’s perception of negativity ($F(1,36)=8.3, p<.01$). The Writer believes the feedback to be more negative when the feedback is delivered through IM than through videoconferencing. The Writer’s medium is a nearly significant factor, ($F(1,36)=2.9, p<.1$). However, the Writer rates the feedback as more negative if he is using videoconferencing instead of IM.

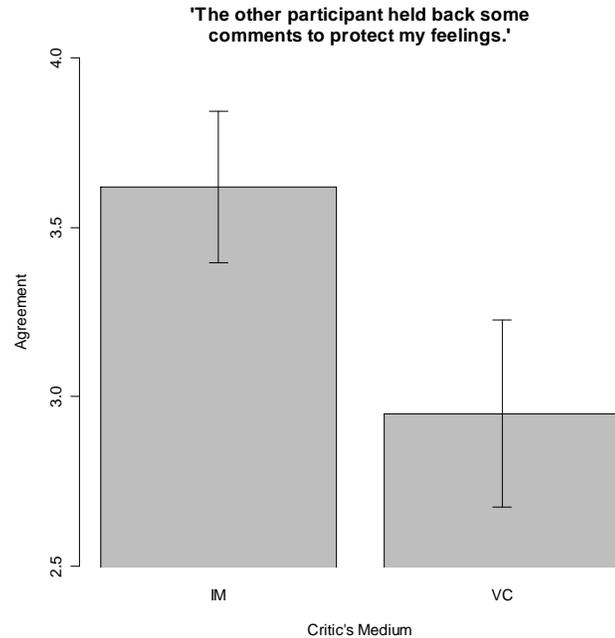


Figure 15: Perceived threat regulation, by Critic's medium

The second hypothesis has to do with the Writer’s perception of threat regulation. Writers were asked four Likert-scale questions. The first asked directly, “The feedback I received was polite.” The other three questions asked whether the Writer believed that the Critic was trying to protect the Writer’s feelings. These questions do not cohere into an acceptable scale measure, so each is analyzed separately. Again, efficacy is included in the analyses.

Two questions dealt specifically with whether the Critic was withholding information in order to protect the Writer’s feelings. For both of these questions, the Critic’s medium was a significant factor ($p < .05$). The Writer believed that the Critic was withholding more when communicating over IM than over videoconferencing (see Figure 15). The other two threat regulation questions had no significant predictors.

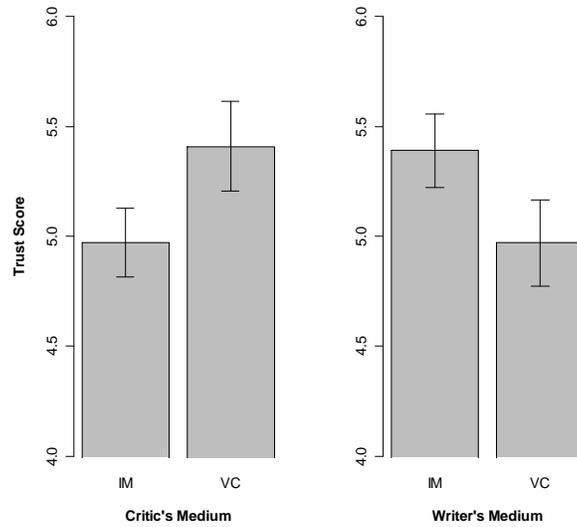


Figure 16: Writer's trust in Critic

Perceptions of Source Credibility

The first source credibility hypothesis suggested that the level of interactivity in the communication environment would affect the Writer's trust in the Critic. Five questions from the Conditions of Trust Inventory (Butler, 1991) were asked of the Writer. These questions show a high level of internal consistency ($\alpha=.85$). The data show only marginally significant effects from both the Critic's ($F(1,38)=3.1, p<.1$) and Writer's ($F(1,38)=3.0, p<.1$) medium.

While these results do not reach the level of significance, it is interesting that these effects show opposite directions (see Figure 16). The Writer trusts the Critic more if he sees and hears the Critic in videoconferencing. However, the Writer's trust is also higher if the Critic cannot see and hear the Writer.

Hypothesis 4 suggests that the Writer's perception of the Critic's expertise will vary with the interactivity of the communication environment. The Writer was asked if

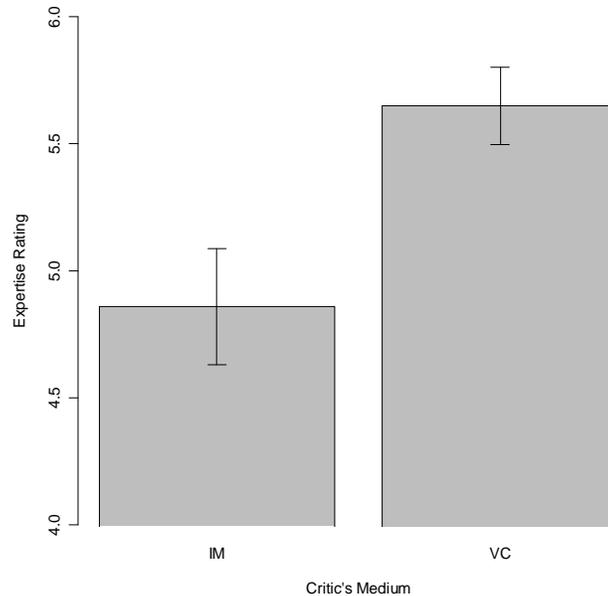


Figure 17: Writer's perception of Critic's expertise, by Critic's medium

the Critic a) understood the problems in the case study, and b) was qualified to provide feedback. These questions were averaged and analyzed by condition. The Writer's perceptions of the Critic's expertise was significantly affected by the medium through which the Critic communicated ($t(35)=-2.9, p<.01$), but not affected by the Writer's medium. In other words, if the Writer saw the Critic through videoconferencing, he would rate the Critic's expertise higher than if he only saw his comments through instant messaging (see Figure 17).

A last of the source credibility hypotheses suggests that the Writer's feelings of mutuality will vary with interactivity. Mutuality is marked by feelings of shared experience and understanding. The Writer was asked four Likert-scale questions about whether he and the Critic agreed on task goals, understood each other, and had common ground. The responses to these four questions were averaged to create a mutuality score.

Internal consistency was marginal ($\alpha=.67$) so results for this variable should be interpreted carefully (Streiner & Norman, 1989).

The analysis shows that the Writer's feelings of mutuality are significantly determined by the Critic's medium ($t(35)=-2.0$, $p<.05$, see Figure 18). There is no significant effect for the Writer's medium.

Feedback Acceptance

The final hypothesis suggests that feedback acceptance will be positively related to the interactivity of the communication environment. We can address this hypothesis with both subjective and behavioral data.

In the post-experiment questionnaires, the Writer was asked a set of six questions about feedback acceptance. These questions show acceptable internal consistency ($\alpha=.86$), and were averaged to create an acceptance score. The subjective acceptance score is significantly determined by the Critic's medium ($t(37)=-2.1$, $p<.05$), but not by

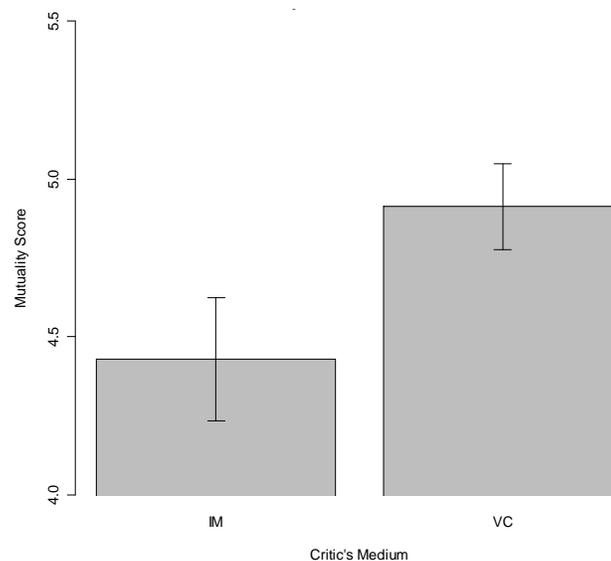


Figure 18: Writer's perception of mutuality, by Critic's medium

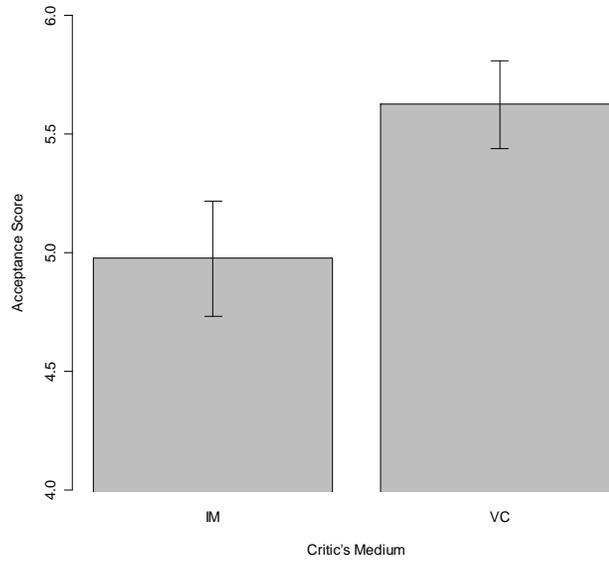


Figure 19: Feedback acceptance (subjective) by Critic's medium

the Writer's medium.

We can see that Writers are more likely to say that they accept the feedback if it is delivered via videoconferencing rather than IM (see Figure 19).

When we look at the behavioral data, we see a slightly different pattern. First, an

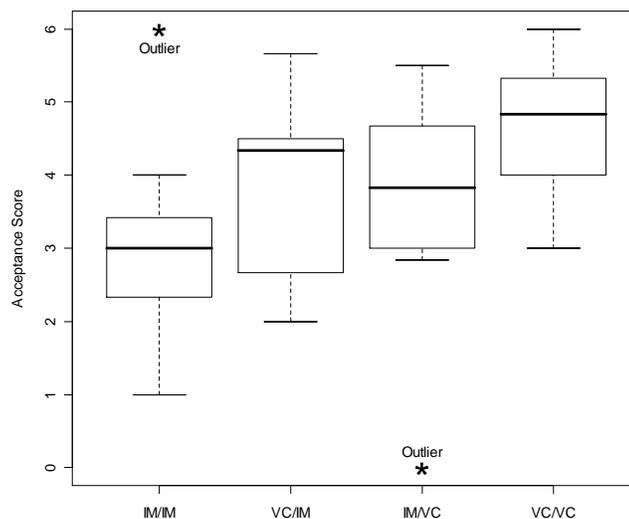


Figure 20: Acceptance coding boxplot showing outliers

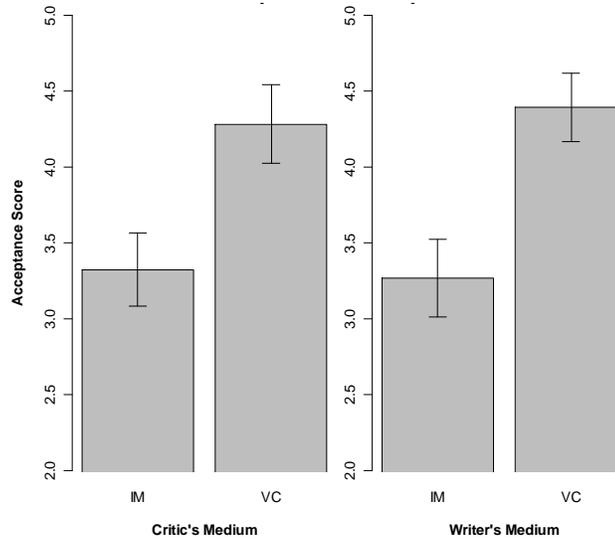


Figure 21: Feedback acceptance (behavioral)

examination of the data shows two obvious extreme outliers (see Figure 20). The first outlier followed all of the Critic's feedback, but made no other edits. Only three subjects in the experiment had an acceptance score of 6, and the other two were in the VC-to-VC condition. The second subject made no edits whatsoever to their document, and was the only participant in the experiment to make no changes. These outlying scores have been removed from this analysis.

The remaining data show significant effects on feedback acceptance from both the Critic's medium ($F(1,36)=9.5$, $p<.01$) and the Writer's medium ($F(1,36)=12.5$, $p<.01$). (See Figure 21).

One of the clear differences between the subjective questionnaire ratings and the behavioral data is that while the Writers said that their acceptance depended only on the Critic's medium, their behavior shows that acceptance depends on both the Writer's and Critic's media. Figure 22 shows the questionnaire and behavioral data side-by-side for all four conditions.

This disparity between the Writers' perceptions of their acceptance and their behavior is somewhat surprising. The questionnaire data show that what is most salient to Writers is the medium in which they receive the feedback. The behavioral data, on the other hand, suggest that the Writers' ability to participate in the conversation is an important factor in feedback acceptance, even if the Writers are not aware of it.

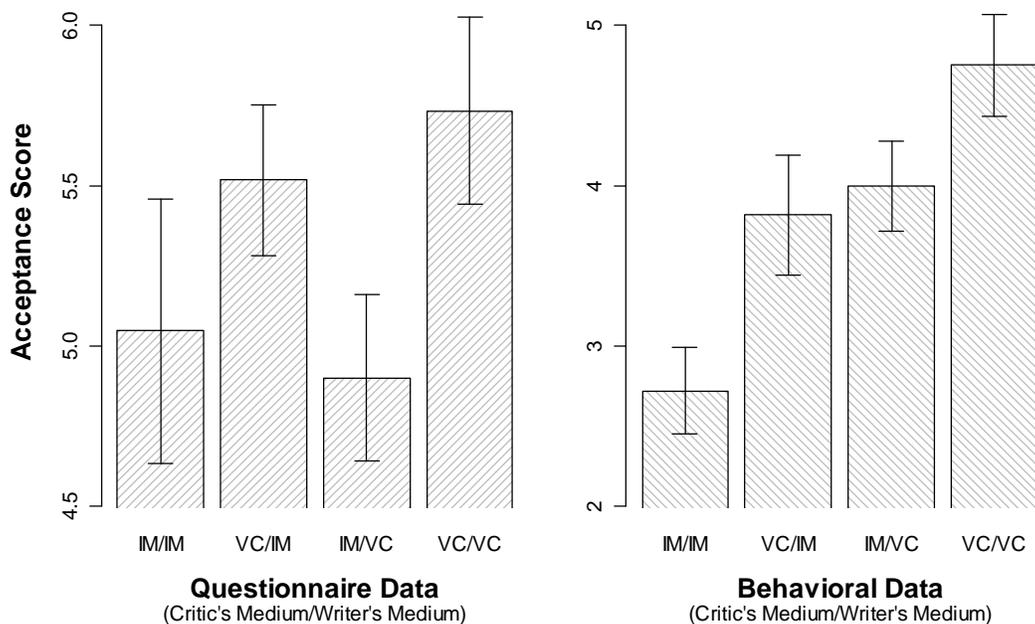


Figure 22: Feedback acceptance—questionnaire and behavioral data

Summary

This experiment was designed to provide a second look at the question of mediated interpersonal feedback, and to address some of the shortcomings of the first experiment. Table 8 summarizes the findings. Even though the scope is significantly narrower, this experiment provided stronger and more consistent results. Writers' perceptions of the critic and the feedback tended to be significantly influenced by the Critic's medium but not the Writer's own medium. On the other hand, acceptance behavior was significantly influenced by both the Critic's medium and the Writer's own medium.

This experiment clearly demonstrates that the communication media used in feedback conversations have consequences for how feedback is perceived and used. The next chapter will compare the results from the first and second experiment, discuss these results in the context of a theory of interactivity, and make suggestions for further avenues of study.

Table 8: Summary of experiment 2 findings

| Category | Hypothesis | Significant Effects | Notes |
|----------------------------|-----------------------|--|---|
| Content & Style | H1: Negativity | Critic's medium* and Writer's medium ⁺ | Perceived to be more negative when Critic is using IM, or when Writer is using VC |
| | H2: Threat regulation | Critic's medium* | More perceived withholding when feedback delivered via IM |
| Source Credibility | H3: Trust | Critic's medium ⁺ and Writer's medium ⁺ | Trust is higher when Critic uses VC. Also higher when Writer uses IM. |
| | H4: Expertise | Critic's medium** | Expertise judged higher if Critic is using VC |
| | H5: Mutuality | Critic's medium* | Mutuality judged higher if Critic is using VC. |
| Response | H6: Acceptance | <i>Perceptual:</i> Critic's Medium* | For all significant effects, acceptance is higher in VC than in IM. Note the difference between perceptual and behavioral measures. |
| | | <i>Behavioral:</i> Critic's Medium** and Writer's Medium** | |

** p<.01; * p<.05; + p<.1

CHAPTER 5

DISCUSSION

This chapter summarizes and discusses the findings of the two experiments presented in the preceding chapters. We then examine how these results contribute to our understanding of interactivity in mediated communication environments. Finally, the chapter will consider the limitations of this research, and outline potential future avenues of study.

Summary of Experiments and Findings

Two experiments were conducted to examine the effects of communicative interactivity on interpersonal critical feedback. In both experiments a participant created a document based on a business case study. This Writer then received feedback about how to make the document better. In the first experiment, this feedback was delivered by another experimental subject, whereas in the second experiment a confederate delivered the feedback. The feedback was delivered in one of four communication environments using instant messaging and videoconferencing in various combinations. After receiving feedback, the Writer was given the opportunity to edit the document before submitting a final version. Data were collected through questionnaires, analysis of feedback

conversations, and analysis of the changes that the Writers made to their documents after receiving feedback.

Feedback Delivery

These experiments allow us to say relatively little about media effects on feedback delivery. Critics' ratings of their own negativity, threat regulation, and feelings of mutuality do not show significant differences between experimental conditions. In the first experiment, analysis of conversation transcripts showed that the level of negativity in the feedback was determined by an interaction of the Writer's communication medium and gender: male Critics gave more positive feedback when they could see and hear the Writer, while female Critics gave more positive feedback when they could not see and hear the Writer. Because the second experiment used a confederate Critic and gave all Writers the same feedback, it cannot provide data about feedback delivery. Instead, the focus of the discussion will be on the Writer's interpretation and use of feedback.

Feedback Interpretation and Use

The bulk of the research on feedback processes concentrates on how the recipient perceives and responds to feedback. While many predictors have been considered, including the content of the feedback and personality traits of the recipient, there has been little attention paid before now to effects stemming from the communication environment.

The first experiment did not produce conclusive evidence of media effects on recipients' interpretations of feedback. There were no significant media effects on Writers' perceptions of negativity, trust, mutuality, or feedback acceptance. Shared

understanding did not differ across conditions. Writers perceived greater threat regulation when they received the feedback through IM rather than in videoconferencing. Writers' satisfaction with the feedback they received was determined by a complex interaction of the Critic's medium, the Writer's medium, and gender.

Due to the inconsistency and weakness of these results and the difficulties in obtaining reliable behavioral data, the second experiment made several changes to the method in order to better control the feedback process and reduce unexplained variance.

The second experiment produced more consistent results. Perceptions of negativity, politeness, source expertise, feelings of mutuality, and feedback acceptance were all significantly determined by the Critic's medium. Behavioral measures of feedback acceptance, however, show significant effects from both the Critic's medium and the Writer's medium.

Discussion of Results

This section discusses the results of the two studies. First, I compare the results of the first and the second experiment. While many of the differences between the two experiments result from changes in the experiment itself, there are several comparable results. This will also provide the opportunity to discuss some of the findings about gender that were not tested in the second experiment.

The next section discusses a seeming contradiction that arose in the second experiment. Writers' *subjective* reactions to the feedback seemed not to be affected by their own medium, but the *behavioral* data show that their use of the feedback was. I will discuss the potential interpretations of this finding, and its implications for feedback in mediated contexts.

Finally, we return to this study's primary research question: does interactivity affect the communication of interpersonal feedback? The discussion will compare interactivity effects to those effects predicted by existing CMC theories, and ask if interactivity explains the experimental results better than these other theories.

Two Experiments Compared

The second experiment was designed to address many of the shortcomings of the first experiment by changing key features of the experimental method. It used a confederate in the Critic role, and as such, did not address how the process of *giving* feedback is affected by the experimental media. Additionally, only male subjects participated in the second experiment, so it could not replicate the gender findings from the first experiment.

The first experiment found no significant determinants of Writers' perceptions of negativity, trust, mutuality, or feedback acceptance. But in the second experiment, the Critic's medium was a significant determinant of these variables. One of the motivating factors for the design of the second experiment was to increase control of the unexplained variance. These differences between the first and second experiment are likely explained as an increase in statistical power.

One of the more surprising results in the first experiment were the interactions between communication condition and gender for feedback sign, trust, mutuality, and satisfaction. There have been a number of studies of gender in computer-mediated communications, but the majority of these studies have focused on asynchronous virtual groups (Herring, 2000). One theme in this research deals with issues of identity presentation and salience, suggesting, for example, that mediated virtual environments

create a space for exploration of gender identities (Bruckman, 1993). Another thread focuses on whether what we know about how men and women communicate in face-to-face settings holds true in mediated communication (for example Gefen & Ridings, 2005). But these studies have generally taken one of two approaches, asking either about how men and women communicate in a particular medium, or how the way that men and women communicate in CMC differs from face-to-face. The results from the present study, however, suggest that men and women may have different reactions to different mediating technologies. For example, male Critics gave more positive feedback if they could see and hear the Writer, but female Critics gave more positive feedback when they could *not* see and hear the Writer. This kind of interaction suggests that CMC research would benefit from a richer characterization of the relationship between gender and communication affordances.

Given these gender interactions, we can better compare the two experiments by reanalyzing the first experiment's data without the female participants. With only half of the sessions in the analysis, we would expect a corresponding reduction in power, and fewer significant results. This was the case for threat regulation, trust, mutuality, and subjective acceptance. Even though the analyses did not show significant differences among conditions, the data show the same directional trends as we found in the second experiment. For example, male Writers in both experiments showed higher levels of trust when the Critic used videoconferencing.

With all the subjects in the first experiment, gender was the only predictor of the Writer's perceptions of feedback negativity. However, when the analysis is limited to men only, the Writer's medium emerges as a significant predictor of the Writer's

perceptions of negativity ($F(1,15)=12.7, p<.01$). This is not consistent with the second experiment. In the first experiment, Writers perceive the feedback to be more negative if the Writer is using IM. In the second experiment, Writers perceive the feedback to be more negative if the Writer is using VC (marginally significant). Although the Critic's medium is a not significant predictor in the first experiment, in both the first and second experiment Writers perceived the feedback to be more negative when the Critic was using IM.

An interesting finding from both experiments is that Writers perceive that the Critic is withholding more information when the feedback is delivered via IM. This perception may be related to perceptions of negativity in the feedback. Even though the actual feedback was equally negative in all conditions (the analysis of feedback transcripts from the first experiment did not show a difference in negativity due to Critic's medium, and Writers all received the same feedback in the second experiment), the second experiment shows significant effects of the Critic's medium on the Writer's perception of negativity. Further analysis of the second experiment data shows a moderate correlation between perceptions of negativity and threat regulation by withholding ($r^2=.29$). Writers who perceive feedback more negatively in IM seem to also believe that the Critic is withholding bad news. While our data do not allow a causal analysis, it could be that when the Writer tries to understand what the Critic *intends*, the belief that the Critic is withholding bad news leads the Writer to interpret IM-delivered feedback more negatively.

While not our primary focus, it is also interesting to note that the self-efficacy metrics showed different results in the two experiments. The standard self-efficacy scales

used in the first experiment were not significant predictors in any of the analyses, but the task-specific efficacy used in the second experiment was. The literature suggests that the feedback recipient's self-efficacy is an important factor in feedback processes (for example, Baughman, 1988; Herring & Paolillo, 2006; Nease et al., 1999; Silver et al., 1995; Waldersee, 1994). Specifically, someone who believes that he has done well is less likely to accept negative feedback (and vice versa). We tend to believe feedback that is consistent with our own self-evaluation.

In the first experiment, general self-efficacy scales were used, and were collected before subjects knew anything about the task they would be completing. In the second experiment, we asked subjects to rate their own performance after they had written the essay, but before they received feedback. The first experiment used very general efficacy questions and made an assumption that Writers' task-specific self-evaluation would match their general self-efficacy. This assumption, however, introduces extra noise into the data. In other words, predicting the Writer's evaluation from general self-efficacy cannot capture if the Writer had a bad day, or that this task happened to fall into a particular weak area for the subject. Asking Writers to evaluate their own performance *after* writing the document (but before receiving feedback) eliminates the problematic assumption. As a result, the task-specific evaluation used in the second experiment proved to be more useful than the general self-efficacy scales used in the first.

Behavioral vs. Perceptual differences

The second experiment revealed inconsistencies between Writers' feelings and their behavior in the area of feedback acceptance. Writers were asked questions to gauge whether they believed the feedback they had been given. The Writers' essays were also

examined to determine if they incorporated the suggested changes into the final version. This gave us both subjective and behavioral measures of feedback acceptance. The data suggest, however, that while the subjective acceptance is significantly determined only the Critic's medium, behavioral acceptance is significantly determined by both the Critic's medium and the Writer's medium.

Discrepancies between self-reports of cognitive functions and actual behavior is a long-studied problem in psychology (Maier, 1931). People are generally unable to directly access and report on high-level cognitive processes (Mandler, 1975). In other words, when people are asked to explain *how* or *why* they made a decision, they rely not on any introspective awareness of their cognitive processes, but instead on *a priori* causal theories (Nisbett & Wilson, 1977). However, in this experiment, subjects were asked to report on a psychological state or emotion, not on the underlying cognitive or behavioral process. In other words, participants were asked to rate their acceptance of the feedback, not to explain why they did or did not accept the feedback.

Self-reports are often the best way to assess psychological states (Clore, 1994), but given the urge to make sense of and build narrative around our experiences, subjects may still report how they think they *should have felt* in a situation. Self-reports will have the highest fidelity when they are most accessible (Robinson & Clore, 2002). If an emotion has faded in time, or it was not particularly salient, self-reports will tend to reflect situational and identity-related beliefs (e.g. it was a party, and I like parties, so I must have been having fun). In this experiment, subjects were given the questionnaire immediately after completing the task, when the thoughts should have been still fresh in

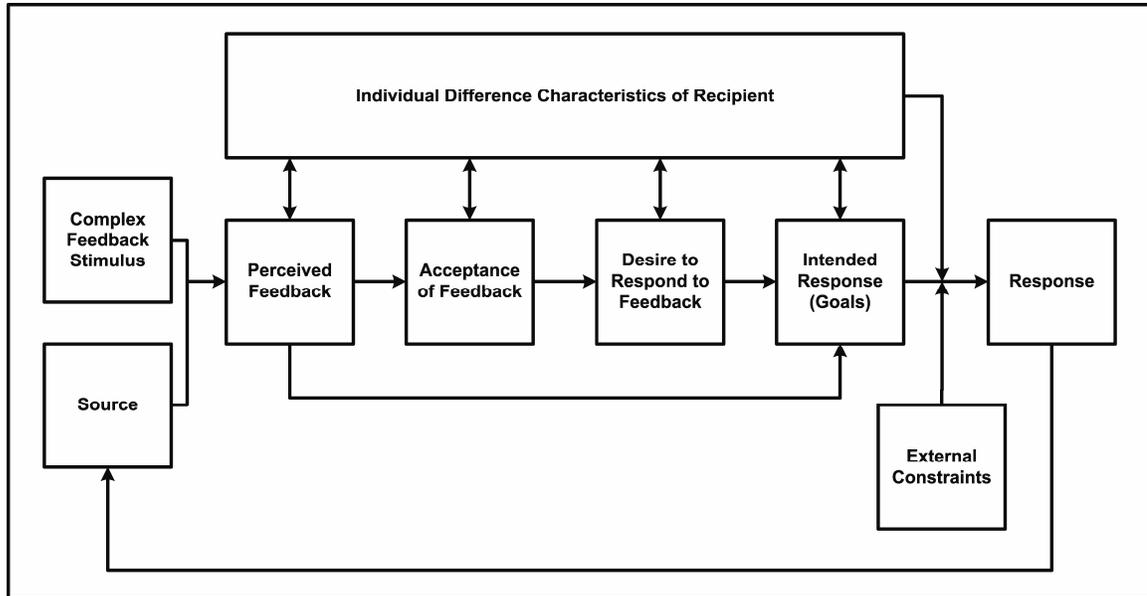


Figure 23: Model of the effects of feedback on recipients, from Ilgen, et al., 1979.

their minds. This suggests that the questionnaire data should reflect the subjects' true responses to the feedback.

In order to understand the discrepancy between the subjective and behavioral responses, it will be useful to look back at Ilgen et al.'s model of feedback effects (Figure 23). In their model they distinguish between feedback "acceptance" and feedback "response." Whether or not the recipient believes the feedback (acceptance) is only one variable lying between the stimulus and response. Also influencing the response are the perception of the feedback, the desire to respond (motivation) and the intention to respond (goals). These cognitive factors together (along with individual characteristics of the recipient and the external constraints) determine the behavioral response. The difference between subjective feedback acceptance and the behavioral response could be explained by motivation.

In the experiment, we assume that individual characteristics are distributed randomly among conditions, and that everyone is operating under the same or randomly

distributed external constraints. The data show that the Writers' perceptions and acceptance of the feedback are determined by the Critic's medium, but not the Writer's medium. And care was taken in the experiment to set the same task performance goals for all subjects. The only unexplained variable is the desire to respond.

This would not be an entirely surprising result. When the Writer is able to participate more in the feedback process, he may develop a greater feeling of ownership in the task. There may also be an aspect of ego-protection involved—negative feedback may not be as threatening if the Writer feels more involved in discovering problems and generating solutions. This emotional investment could pay off in the form of greater motivation to respond to the feedback.

Interactivity in Feedback

The central question in this study has been how the interactivity of a communication environment affects feedback communication, interpretation, and use. Interactivity is that property of a communication environment that allows for the development of double interacts—patterns of interlocked and contingent action and reaction. It will be useful to once again compare interactivity to other computer-mediated communication (CMC) theories, and think about how we recognize interactivity effects in the context of this study.

Many CMC theories focus on the types of information that a particular technology can effectively transmit. For example, electronically mediated communications may inhibit social context cues, reduce the amount of social identity information that is shared, or limit non-verbal channels of communication. These have been referred to as “cues-filtered-out” theories.

A further development of CMC research came when researchers began deconstructing communication media to focus on how the media structured the act of communication (Clark & Brennan, 1991; Kraut, Fussell et al., 2002). These “constraints” or “affordances” were not a complete departure from other theories. Concern for the affordances of visibility and audibility had significant overlap with the focus in media richness theory on “non-verbal cues.” But with affordances came a new interest in communication process, and especially communicative grounding. Grounding is the social process of developing shared understanding through interaction.

This study builds on this stream of research, and shares the same concern with how properties of a communication environment affect the ability of participants to have a successful conversation (for example Kraut, Gergle et al., 2002; for example Veinott et al., 1999). This study also draws on other work that has looked at how mediation can affect relational aspects of communication (Cramton, 2002; Horn, 2001; Huang et al., 2002).

Clark et al.’s work on grounding, and Weick et al.’s work on sensemaking both make the claim that interlocked and contingent action are required for building meaning. This study takes that claim seriously, and asks whether changes in specific technology affordances affect the ability to create interlocked and contingent action.

Using Kraut et al.’s list of affordances of communication media (adapted from Clark and Brennan’s list of technological constraints on grounding), we can look specifically at which affordances change across our four experimental conditions. All conditions lack tangibility, copresence, and mobility. All conditions afford cotemporality (present at the same time), simultaneity (can send and receive at the same time). Only the

videoconferencing medium affords audibility, and visibility, and sequentiality (non-overlapping turn-taking) while only the IM medium affords reviewability and revisability (see Table 1).

However, most prior studies of communication media assume that all participants in a conversation will be using the same medium, and the literature on grounding and affordances is no different. The present study does away with that assumption. This allows us to consider communication balance. Unlike other affordances, balance is a property of the communication environment rather than any individual communication medium (see Figure 2 in Chapter 2). A communication environment is balanced if it provides all participants the same set of media affordances.

By looking at a combination of balanced and unbalanced environments, we can distinguish bandwidth effects from interactivity effects. Bandwidth effects refers to those effects that arise from the ability to send more or richer information over a channel. For example, videoconferencing allows the recipient to not only hear the words, but also to receive body language and tone-of-voice cues that may be missing (or more expensive to replicate) in IM. Interactivity effects are those that arise from the ability to have interlocked and contingent conversation.

Increasing bandwidth or interactivity are both strategies for reducing uncertainty or equivocality. But relational factors can also be influenced by both bandwidth and interactivity. (Zheng et al., 2002) found that having a picture of a remote participant can lead to increased trust, but that trust is also increased by having a social interaction before completing a cooperative task.

Varying the communication media in a 2x2 ANOVA design allows differentiation of these two kinds of effects. In the context of this study, if the Writer's comprehension, interpretation and behavior are affected *only* by the Critic's medium, these are most likely bandwidth effects. However, if the effects on the Writer are also determined by the Writer's own medium (as a main effect or interaction with the Critic's medium), it is likely that interactivity is playing a role.

Let us turn now to what the two experiments in this study say about feedback reception and use. The first experiment did not produce convincing results either confirming or disconfirming interactivity effects. But the second experiment did produce significant results, and brings us back to our discussion of the differences between behavioral and perceptual measures. The evidence suggests that bandwidth is a stronger determinant of the Writer's perceptions than interactivity. However, Writer's perceptions of negativity and trust in the Critic both showed nearly significant effects from the Writer's medium. On the other hand, the degree to which Writers incorporated the feedback into their documents was determined by both the Critic's medium and the Writer's medium, suggesting that interactivity is playing a role.

As discussed in the previous section, one of the potential explanations for this difference is that interactivity could be important in this context for developing motivation and feelings of investment in the process. Most of the research on communication affordances has focused on grounding. While it is important to consider comprehension and understanding in the communicative process, the present study also demonstrates that this is not the only purpose of communication. This study begins to

show how an affordances-based approach could be useful for examining other relational aspects of communication like motivation, influence, and identity.

Limitations of this Research

There are several limitations of this research that should be kept in mind. First, we should heed the idea developed in the literature review that understanding media effects requires understanding the purpose of communication, the communication environment, and the strategies available within that environment. Each of these factors restricts the degree to which these results will generalize. Critiquing someone else's work involves a complex set of issues around roles, power dynamics, delivery of bad news, threat regulation, gender, and so forth. We cannot assume that the same patterns of results will appear in other kinds of communication. Similarly, we should be careful extending these findings to other mediated communication environments beyond those tested here.

These experiments were conducted with zero-history dyads—the participants had not met or interacted before the experiment. This again limits generalizability. As groups continue to work together over a longer period, they may develop different communication strategies or go through different stages of relational interaction (Walther, 1992). We cannot assume that the effects seen here would persist over time.

The previous chapters have already discussed many of the shortcomings of the first experiment. It tried to replicate a real-world critique task as closely as possible. However, in the event, this produced too much unexplained variance and made it difficult to isolate media effects. Additionally, the coding schemes were not able to produce reliable enough behavioral data. Any results from the first experiment should be treated as exploratory.

In order to control this variance, the second experiment was modified to use a confederate in the Critic role, but this change came at the expense of external validity. Even though the feedback script was developed using actual feedback from the first experiment, it was delivered by an actor with instructions to have essentially the same conversation with everyone. This also means that the second experiment could not test all of the theorized interactivity effects. For example, one tenet of a theory of interactivity is that through interaction, both parties can change and grow and build a shared experience. But because of the use of scripted feedback, the Critic's "thinking" could not evolve during the conversation.

One of the assumptions of this study is that changing the cost of communication, and especially changing the balance in the cost of communication, will disrupt the formation of double interacts. The results of the second experiment suggest that interactivity is not a significant determinant of many of the Writer's subjective reactions to the feedback. This was interpreted as a lack of support for a theory of interactivity. A plausible alternative explanation could be that interactivity was afforded equally in all conditions. Even though the communication costs varied across conditions, it was still always possible for the Writer to send messages to the Critic. Research has shown that it is possible to create double interacts in even the most limited communication media (Rabinowitz et al., 1966). It is possible that there is some threshold effect for interactivity—that as long as a certain level of interactivity is reached, comparative communication costs are irrelevant. However, this interpretation seems unlikely given that much CMC literature and Weick's work on sensemaking stress that the richness of the interaction cannot be ignored.

Limitations of Affordances in CMC Research

As discussed in Chapter 3, interpretation of the first experiment's results was hampered by the large amount of variance in the data. It also became clear that predicting the interactivity of a communication environment was not necessarily as straightforward as had been assumed. In order to control this variance for the second experiment, it was also necessary to eliminate a good deal of the equivocality of the task and reduce the external validity of the experiment. These issues suggest that we may need to reassess our reliance on the traditional model for CMC research.

Figure 2 (in Chapter 2) shows a typical experimental CMC research approach. In these studies, causality is assumed to operate almost exclusively as shown—with changes in the features of the technology predicting (even if through several steps) changes in task performance. I suspect that in practice, however, the lines of causality are much more jumbled and less clear.

Taking the case of mediated feedback, balanced participation will be affected by much more than simply the particular communication environment. Feedback conversations have role norms such that the person giving feedback will probably contribute more than the person receiving feedback. Balance could also be affected by differences in status, personality, or experience among participants. The processes and behaviors that arise, and the way that technological features are expressed as affordances, are affected as much by characteristics of the task as vice versa. The relationships among the layers of the model will also change as the processes are enacted. For example, successful sensemaking early in a task may reduce the need for balanced participation later on.

In their early work on media richness, Daft and Lengel (1986) distinguished between uncertainty and equivocality. Uncertainty is a situation in which the parameters are clear, but there is a lack of information. Equivocality, on the other hand, exists when there is ambiguity, confusion, or conflicting interpretations—participants may not know what questions to ask, and more information may not actually help resolve the situation. Daft and Lengel suggest that laboratory studies of decision making tended to recreate conditions of uncertainty rather than equivocality, even though equivocality is more present in real organizational activities. This insight seems to carry over into CMC laboratory research as well. Our focus has been on tasks like distributed bicycle repair, lego construction, or map following, that are characterized by greater uncertainty than equivocality. As we work with more equivocal tasks, where the communication needs and strategies may not be well-defined, we may find that we require a more nuanced approach to the interaction of technological features with task outcomes.

Directions for Future Research

There are several avenues for future research suggested by this study. First, there are several questions that this study did not directly address, but are important for understanding mediated feedback processes. For example, this study did not address feedback processes among people who know each other, or whether the feedback processes change over repeated or longer feedback conversations. This study also only looked at two technologies, instant messaging and videoconferencing, and it would be important to know if these results generalize to other media environments.

There are also follow-on studies to address questions raised by this study. For example, it would be appropriate to examine the impact of interactivity on Critics. The

second experiment used a confederate in the Critic role, and focused on the Writer's interpretation of and response to feedback. Using a confederate in the Writer's role would allow more controlled examination of whether affordances of the communication environment the feedback given by the Critic.

Another obvious issue in these experiments is the role of gender in mediated communication. The first experiment suggested that several variables including negativity, trust, mutuality, and satisfaction are determined by an interaction of gender and communication media. The scope of this study did not allow follow-up on these particular findings in the second experiment, but they do remind us that while gender has been an important variable in communications and social psychology research, it has not been studied extensively in the CMC literature.

Finally, a key characteristic of critical feedback that has been exploited in this study is that this kind of communication demands both accurate conveyance of meaning and successful emotional and relational management. Good feedback not only "tells it like it is," but also presents critiques so that they are palatable to the recipient. While this is obvious for feedback conversations, these same dimensions apply to much interpersonal and organizational communication. In fact, a key tenet of the emerging field of Positive Organizational Scholarship is that the quality of interpersonal interaction is a key factor in organizational success (Cameron, Dutton, & Quinn, 2003). Similarly, Thagard (2002; 2004) proposes that a key process in mentoring is the teaching of the appropriate emotional basis for decision-making. This suggests a need for a richer approach to mediation effects that look beyond grounding. Research on trust, attribution, and conflict in CMC and distributed work has begun to move in this direction. This study

began to look at whether the same kinds of grounding processes that influence comprehension in conversations also apply to the interpersonal calibration of emotions and interpretations. But there is still an opportunity to push this further, and study both the development and consequences of shared affect and emotion in CMC, in both short and long-term mediated relationships.

APPENDICES

Appendix 1

Experiment 1 Protocol Summary

| Approx. Timing | Writer | Critic |
|--------------------------------------|---|---|
| 0:00 | Subjects arrive; As soon as they arrive, take each to own room so that they do not meet; Explain to Critic that it will be “a few minutes until we’re ready to start” | |
| 0:02 | Consent; Administer pre-questionnaire (Appendix 4) | (Critic waits) |
| 0:10 | Give instructions (Appendix 2) and case study; Give 30 minutes to read and write PPT document | Consent; Administer pre-questionnaire (Appendix 6) |
| 0:20 | | Give instructions (Appendix 3) and case study; Give 20 minutes to read and prepare |
| 0:40 | Save and close PPT document; Transfer document to network drive; Give Writer 10 minutes to wait (“browse the web or just hang out here”) | Open PPT document in web browser (not editable); Give Critic 10 minutes to prepare feedback on the document |
| 0:42 | | |
| 0:50 | Open PPT document (read only); Prepare communication media | |
| 0:52 | Connect Critic and Writer in appropriate media condition for feedback conversation | |
| 1:02 | End conversation, disconnect media | |
| 1:03 | (Writer waits) | Close computer; Administer post-questionnaire (Appendix 7) |
| 1:04 | Close browser; Open editable local copy of PPT document; Give Writer “as long as you need” to edit document | |
| Critic finishes questionnaire | Save document; Administer post-questionnaire (Appendix 5) | Collect questionnaire; Debrief, pay and dismiss Critic |
| Writer finishes editing | | |
| Writer finishes questionnaire | Collect questionnaire; Debrief, pay and dismiss Writer | |

Appendix 2

Experiment 1 Writer Instructions

Instructions

We will ask you to pretend that you work for Acme Consulting Company, and you are consulting for a company called MMI. You will be given information about a problem that is happening at MMI. After you have read the information, you will be asked to create a 4-slide PowerPoint presentation that explains what you think the managers should do. This PowerPoint presentation would be sent as an e-mail attachment to Gene Kozlowski, the MMI Vice President for Human Resources.

Acme Consulting PowerPoint presentations all have the same general outline. The first slide should have a title that reflects the problem you are addressing. It should also have the client's name and the name of the consultant who prepared the presentation (you). Each of the following 3 slides should have a recommended course of action and justifications for the recommendation. Each slide should have at least 3 and no more than 10 bullet points. The writing should be direct and to the point.

Your manager at Acme Consulting has decided that since MMI is such an important client, it would be best if another consultant from Acme looked over your presentation before you present it. After you have created the slide presentation, it will be given to another "consultant" who will read it through, and then give you comments.

After your discussion with the other Acme consultant, you will have some time to make any edits or changes that you think would improve the PowerPoint presentation.

When you are finished, we will give your presentation to a business consultant who is familiar with this scenario. Your PowerPoint presentation will be graded on a 10-point scale for the appropriateness of your suggested course of action (5 points) and the persuasiveness of the presentation (5 points). You may receive a bonus depending on your total score:

| Score | Bonus |
|-------|-------|
| 10 | \$5 |
| 9 | \$4 |
| 8 | \$3 |
| 7 | \$2 |
| 6 | \$1 |
| 0-5 | \$0 |

After you have submitted the PowerPoint presentation, we will ask you to fill out a questionnaire about your experience.

Appendix 3

Experiment 1 Critic Instructions

Instructions

We will ask you to pretend that you are a consultant with Acme Consulting Company. Another Acme Consultant is working on a project for MMI Corporation, and has asked you to provide feedback on a PowerPoint presentation before it is delivered to the client. You will be given a background sheet about a problem that is happening at MMI. The other consultant has created a 4-slide PowerPoint presentation that explains what steps should be taken in response to the problem. This PowerPoint presentation would be sent as an e-mail attachment to Gene Kozlowski, the MMI Vice President for Human Resources.

You will receive an electronic copy of the PowerPoint presentation and have a few minutes to look it over. Then you will give feedback to the other consultant about how to make the presentation better.

Acme Consulting PowerPoint presentations all have the same general outline. The first slide should have a title that reflects the problem you are addressing. It should also have the client's name and the name of the consultant who prepared the presentation. Each of the following 3 slides should have a recommended course of action and justifications for the recommendation. Each slide should have at least 3 and no more than 10 bullet points. The writing should be direct and to the point. When reading the PowerPoint presentation, you should be asking yourself:

- Are the recommendations appropriate? Do you think they will solve MMI's problem? Is the solution workable?
- Are the recommendations justified? Does the evidence in the PowerPoint presentation convince you? Is anything important left out?
- Are the recommendations presented well? Is the presentation visually clear and appealing? Is the spelling, grammar, and style correct?

After you have provided feedback, the other consultant will then be given some time to make any edits or changes that he or she thinks are necessary.

***** please turn over *****

When the PowerPoint presentation is complete, we will give the presentation to a business consultant who is familiar with this scenario. The PowerPoint presentation will be graded on a 10-point scale for the appropriateness of your suggested course of action (5 points) and the persuasiveness of the presentation (5 points). You may receive a bonus depending on the total score:

| Score | Bonus |
|-------|-------|
| 10 | \$5 |
| 9 | \$4 |
| 8 | \$3 |
| 7 | \$2 |
| 6 | \$1 |
| 0-5 | \$0 |

At the end of the task, we will ask you to fill out a questionnaire about your experience.

Appendix 4

Experiment 1 Writer Pre-Experiment Questionnaire

Pre-Experiment Questionnaire

Gender: Male Female

What year were you born: _____

How long have you lived in the United States? _____ years

What other countries have you lived in? (for at least 6 months)

Is English your first language?

Yes No. My first language is: _____

What is the highest academic degree you have received?

- Less than high school diploma
- High school diploma or equivalent
- Undergraduate degree (for example, B.A., B.S., etc.)
- Graduate degree (Masters or Doctorate)

What was your field/major? _____

What is your current occupation? _____

What is your race or ethnic origin?

- White
- Black/African-American
- Hispanic
- Asian
- Something else: _____

Please indicate how often you use each of the following:

| | Every Day | At least once a week | At least once a month | Less than once a month | Never |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Word Processor | <input type="checkbox"/> |
| Spreadsheet | <input type="checkbox"/> |
| E-mail | <input type="checkbox"/> |
| Microsoft PowerPoint | <input type="checkbox"/> |
| Web pages | <input type="checkbox"/> |
| Instant Messaging | <input type="checkbox"/> |
| Telephone | <input type="checkbox"/> |
| Web cams | <input type="checkbox"/> |
| Video conferencing | <input type="checkbox"/> |
| Chat rooms | <input type="checkbox"/> |
| Online Stores (e.g. Amazon.com) | <input type="checkbox"/> |
| Online auctions (e.g. eBay) | <input type="checkbox"/> |
| Microsoft Windows computers | <input type="checkbox"/> |
| Apple Macintosh computers | <input type="checkbox"/> |
| Unix/Linux-based computers | <input type="checkbox"/> |

Please indicate the degree to which you agree with the following statements by circling the appropriate answer.

I can always manage to solve difficult problems if I try hard enough.

| | | | |
|-----------------|-------------|-----------------|--------------|
| 1 | 2 | 3 | 4 |
| Not at all true | Hardly True | Moderately True | Exactly True |

If someone opposes me, I can find the means and ways to get what I want.

| | | | |
|-----------------|-------------|-----------------|--------------|
| 1 | 2 | 3 | 4 |
| Not at all true | Hardly True | Moderately True | Exactly True |

It is easy for me to stick to my aims and accomplish my goals.

| | | | |
|-----------------|-------------|-----------------|--------------|
| 1 | 2 | 3 | 4 |
| Not at all true | Hardly True | Moderately True | Exactly True |

I am confident that I could deal efficiently with unexpected events.

| | | | |
|-----------------|-------------|-----------------|--------------|
| 1 | 2 | 3 | 4 |
| Not at all true | Hardly True | Moderately True | Exactly True |

Thanks to my resourcefulness, I know how to handle unforeseen situations.

| | | | |
|-----------------|-------------|-----------------|--------------|
| 1 | 2 | 3 | 4 |
| Not at all true | Hardly True | Moderately True | Exactly True |

I can solve most problems if I invest the necessary effort.

| | | | |
|-----------------|-------------|-----------------|--------------|
| 1 | 2 | 3 | 4 |
| Not at all true | Hardly True | Moderately True | Exactly True |

I can remain calm when facing difficulties because I can rely on my coping abilities.

| | | | |
|-----------------|-------------|-----------------|--------------|
| 1 | 2 | 3 | 4 |
| Not at all true | Hardly True | Moderately True | Exactly True |

When I am confronted with a problem, I can usually find several solutions.

| | | | |
|-----------------|-------------|-----------------|--------------|
| 1 | 2 | 3 | 4 |
| Not at all true | Hardly True | Moderately True | Exactly True |

If I am in trouble, I can usually think of a solution.

| | | | |
|-----------------|-------------|-----------------|--------------|
| 1 | 2 | 3 | 4 |
| Not at all true | Hardly True | Moderately True | Exactly True |

I can usually handle whatever comes my way.

| | | | |
|-----------------|-------------|-----------------|--------------|
| 1 | 2 | 3 | 4 |
| Not at all true | Hardly True | Moderately True | Exactly True |

Appendix 5

Experiment 1 Writer Post-Experiment Questionnaire

Follow Up Questionnaire

As a final step, please complete this questionnaire. The questions ask you about how you felt about consulting for MMI and working with the other consultant. Your answers will remain confidential and will not be shared with the other consultant.

Section 1

Please indicate how strongly you agree or disagree with the following statements by circling the appropriate number for each question below.

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Slightly Disagree
- 4 = Neutral
- 5 = Slightly Agree
- 6 = Agree
- 7 = Strongly Agree

| | Strongly Disagree | | Neutral | | | Strongly Agree | |
|--|-------------------|---|---------|---|---|----------------|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. The problem with Max is easy to solve. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The other consultant performs his/her tasks with skill. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The problem described in the case is realistic. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The first draft of the PowerPoint presentation was as good as it could have been. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Using PowerPoint is easy for me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. I was satisfied with PowerPoint. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. The other consultant shares his/her thoughts with me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. I found it easy to pick out the important details from the MMI situation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. I believe the feedback I received. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. I found it difficult to communicate with the other consultant. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

ID: _____ W

| | Strongly Disagree | | Neutral | | | Strongly Agree | |
|--|-------------------|---|---------|---|---|----------------|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. The feedback I received suggested that the PowerPoint presentation needs a lot of improvement. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. People often tell me that I am argumentative. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. I am typically a very persuasive person. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. The other consultant is qualified to provide advice to MML. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. I can count on the other consultant to be trustworthy. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. The other consultant would not lie to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. The other consultant deals honestly with me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. I think I could have been more persuasive giving an oral presentation of my argument rather than writing it out. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. I believe that everyone should own a gun. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. The other consultant understands how I was thinking. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | Strongly Disagree | | Neutral | | | Strongly Agree | |
|---|-------------------|---|---------|---|---|----------------|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. I am confident that I know what the other consultant thinks of me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. I enjoy discussing political issues. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. The other consultant always tells me the truth. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. I do not agree with the feedback provided by the other consultant. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. The other consultant gave more positive feedback than (s)he thought I deserved. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 26. I trust the other consultant. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 27. I am satisfied with the feedback I received. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 28. The other consultant keeps information from me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 29. The other consultant and I share many interests. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 30. The feedback I received was completely truthful. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

ID: _____W

| | Strongly Disagree | | Neutral | | | Strongly Agree | |
|--|--------------------------|---|----------------|---|---|-----------------------|---|
| 31. The other consultant tells me what he/she is thinking. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 32. The feedback I received was polite. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 33. I incorporated all the other consultant's suggestions into my PowerPoint presentation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 34. The other consultant has my best interests at heart. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 35. I found the feedback I received to be useful. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 36. The other consultant treats me fairly. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 37. It is hard to take the comments that I was given seriously. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 38. Overall, receiving feedback was a satisfying experience. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | Strongly Disagree | | Neutral | | | Strongly Agree | |
|--|--------------------------|---|----------------|---|---|-----------------------|---|
| 39. The other consultant had a clear picture of my performance. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 40. The other consultant could imagine how I was feeling. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 41. The other consultant was as committed to doing the task as I was. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 42. I am qualified to provide advice to MMI. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 43. The other consultant tells me what's on his/her mind. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 44. The other consultant thought I did a good job. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 45. The other consultant tried to protect my feelings. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 46. The other consultant and I agreed about the goals of the exercise. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

ID: _____W

| | Strongly Disagree | | | Neutral | | | Strongly Agree |
|---|------------------------------|---|---|----------------|---|---|---------------------------|
| 47. The other consultant did not get personal in her/his feedback. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 48. I believe we will get the full bonus for the quality of the PowerPoint presentation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 49. I believe that employees who can not do their jobs should be fired, no matter what the cause. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 50. The other consultant and I make a good team. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 51. The feedback I received was positive. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 52. The feedback I received was skillfully communicated. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 53. The other consultant held back some comments to protect my feelings. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 54. The other consultant and I are more similar than we are different. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 55. The other consultant motivated me to do my best work. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Section 2

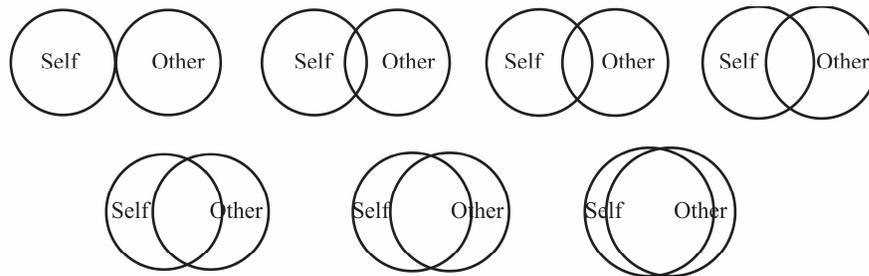
Imagine that you are going to be interacting with the other consultant in the future. Please indicate how strongly you agree or disagree with the following statements by circling the appropriate number.

| | Strongly Disagree | | | | | | Strongly Agree |
|--|------------------------------|---|---|---|---|---|---------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 56. I could talk freely to him/her and know that (s)he would want to listen. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 57. If (s)he unexpectedly laughed at something I did or said, I would wonder if (s)he was being critical and unkind. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 58. If (s)he promised to do me a favor (s)he would follow through. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 59. I would go hiking with him/her in unfamiliar territory if (s)he assured me (s)he knew the area. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 60. If (s)he were going to give me a ride somewhere and didn't arrive on time, I would guess that there was a good reason for the delay. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 61. If we decided to meet somewhere for lunch, I would be certain (s)he would be there. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | Strongly Disagree | | | | | | Strongly Agree |
|--|------------------------------|---|---|---|---|---|---------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 62. I would be able to confide in him/her and know that (s)he would want to listen. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 63. I could rely on him/her to mail an important letter for me if I couldn't get to the post office. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 64. If I had to catch an airplane, I could not be sure (s)he would get me to the airport on time. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 65. I could expect him/her to tell me the truth. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 66. (S)he would never intentionally misrepresent my point of view to others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 67. If I told him/her what things I worry about, (s)he would not think my concerns were silly. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | Strongly Disagree | | Neutral | | | Strongly Agree | |
|--|-------------------|---|---------|---|---|----------------|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 68. If (s)he didn't think I handled a certain situation very well, (s)he would not criticize me in front of other people. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 69. If my alarm clock was broken and I asked him/her to call me at a certain time, I could count on receiving the call. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 70. The other consultant is likely to take advantage of me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 71. I would expect him/her to play fair. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 72. I wouldn't want to buy a piece of used furniture from him/her because I wouldn't believe him/her estimate of its worth. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 73. If (s)he couldn't get together with me as I planned, I would believe him/her excuse that something important had come up. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 74. If (s)he knew what kinds of things hurt my feelings, I would never worry that (s)he would use them against me, even if our relationship changed. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 75. If (s)he gave me a compliment, I would question if (s)he really meant what was said. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

76. Please circle the picture below which best describes your relationship with the other consultant:



Appendix 6

Experiment 1 Critic Pre-Experiment Questionnaire

Participant ID: _____ J

Pre-Experiment Questionnaire

Gender: Male Female

What year were you born: _____

How long have you lived in the United States? _____ years

What other countries have you lived in? (for at least 6 months)

Is English your first language?

Yes No. My first language is: _____

What is the highest academic degree you have received?

- Less than high school diploma
- High school diploma or equivalent
- Undergraduate degree (for example, B.A., B.S., etc.)
- Graduate degree (Masters or Doctorate)

What was your field/major? _____

What is your current occupation? _____

What is your race or ethnic origin?

- White
- Black/African-American
- Hispanic
- Asian
- Something else: _____

Participant ID: _____ J

Please indicate how often you use each of the following:

| | Every Day | At least once a week | At least once a month | Less than once a month | Never |
|---------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Word Processor | <input type="checkbox"/> |
| Spreadsheet | <input type="checkbox"/> |
| E-mail | <input type="checkbox"/> |
| Microsoft PowerPoint | <input type="checkbox"/> |
| Web pages | <input type="checkbox"/> |
| Instant Messaging | <input type="checkbox"/> |
| Telephone | <input type="checkbox"/> |
| Web cams | <input type="checkbox"/> |
| Video conferencing | <input type="checkbox"/> |
| Chat rooms | <input type="checkbox"/> |
| Online Stores (e.g. Amazon.com) | <input type="checkbox"/> |
| Online auctions (e.g. eBay) | <input type="checkbox"/> |
| Microsoft Windows computers | <input type="checkbox"/> |
| Apple Macintosh computers | <input type="checkbox"/> |
| Unix/Linux-based computers | <input type="checkbox"/> |

Appendix 7

Experiment 1 Critic Post-Experiment Questionnaire

Follow Up Questionnaire

As a final step, please complete this questionnaire. The questions ask you about how you felt about consulting for MMI and working with the other consultant. Your answers will remain confidential and will not be shared with the other consultant.

Section 1

Please indicate how strongly you agree or disagree with the following statements by circling the appropriate number for each question below.

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Slightly Disagree
- 4 = Neutral
- 5 = Slightly Agree
- 6 = Agree
- 7 = Strongly Agree

| | Strongly Disagree | | | Neutral | | | Strongly Agree |
|---|----------------------|---|---|---------|---|---|-------------------|
| 1. The problem with Max is easy to solve. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The other consultant performs his/her tasks with skill. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The problem described in the case is realistic. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The first draft of the PowerPoint presentation was as good as it could have been. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Using PowerPoint is easy for me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. The other consultant shares his/her thoughts with me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. I found it easy to pick out the important details from the MMI situation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. The feedback I gave suggested that the PowerPoint presentation needs a lot of improvement. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. People often tell me that I am argumentative. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. I am typically a very persuasive person. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

ID: _____ J

| | Strongly Disagree | | Neutral | | | Strongly Agree | |
|---|--------------------------|---|----------------|---|---|-----------------------|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. The other consultant is qualified to provide advice to MMI. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. I can count on the other consultant to be trustworthy. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. The other consultant would not lie to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. The other consultant deals honestly with me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. I believe that everyone should own a gun. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. The other consultant understands how I was thinking. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. I am confident that I know what the other consultant thinks of me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. I enjoy discussing political issues. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. The other consultant does not agree with the feedback I provided. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. In general, I tend to consider other people's emotional reactions when I communicate. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | Strongly Disagree | | Neutral | | | Strongly Agree | |
|---|--------------------------|---|----------------|---|---|-----------------------|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. The feedback I gave was more positive than the other consultant deserved. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. I trust the other consultant. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. I am satisfied with the feedback I gave. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. The other consultant keeps information from me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. The other consultant and I share many interests. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 26. The feedback I gave was completely truthful. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 27. The other consultant tells me what he/she is thinking. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 28. The feedback I gave was polite. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 29. I have the other consultant's best interests at heart. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 30. Overall, giving feedback was a satisfying experience. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

ID: _____ J

| | Strongly Disagree | | Neutral | | | Strongly Agree | |
|---|--------------------------|---|----------------|---|---|-----------------------|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 31. I could imagine how the other consultant was feeling. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 32. The other consultant was as committed to doing the task as I was. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 33. I am qualified to provide advice to MMI. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 34. The other consultant tells me what's on his/her mind. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 35. I thought the other consultant did a good job. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 36. I tried to protect the other consultant's feelings. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 37. The other consultant and I agreed about the goals of the exercise. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 38. I believe we will get the full bonus for the quality of the PowerPoint presentation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 39. I believe that employees who can not do their jobs should be fired, no matter what the cause. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 40. When I have to give someone bad news, I try to protect their feelings when I communicate. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | Strongly Disagree | | Neutral | | | Strongly Agree | |
|---|--------------------------|---|----------------|---|---|-----------------------|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 41. The other consultant and I make a good team. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 42. The feedback I gave was positive. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 43. I held back some comments to protect the other consultant's feelings. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 44. The other consultant and I are more similar than we are different. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Section 2

Imagine that you are going to be interacting with the other consultant in the future. Please indicate how strongly you agree or disagree with the following statements by circling the appropriate number.

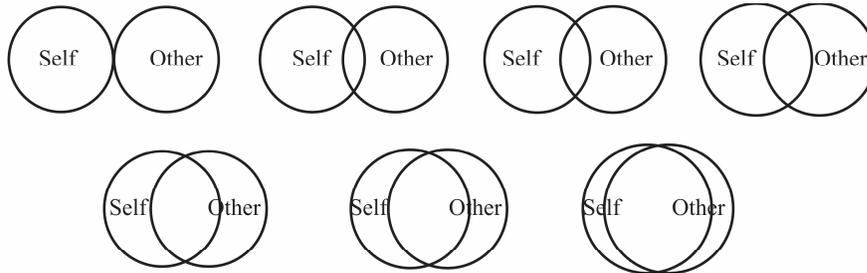
| | Strongly Disagree | | | | | | Strongly Agree |
|--|------------------------------|---|---|---|---|---|---------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 45. I could talk freely to him/her and know that (s)he would want to listen. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 46. If (s)he unexpectedly laughed at something I did or said, I would wonder if (s)he was being critical and unkind. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 47. If (s)he promised to do me a favor (s)he would follow through. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 48. I would go hiking with him/her in unfamiliar territory if (s)he assured me (s)he knew the area. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 49. If (s)he were going to give me a ride somewhere and didn't arrive on time, I would guess that there was a good reason for the delay. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 50. If we decided to meet somewhere for lunch, I would be certain (s)he would be there. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | Strongly Disagree | | | | | | Strongly Agree |
|--|------------------------------|---|---|---|---|---|---------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 51. I would be able to confide in him/her and know that (s)he would want to listen. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 52. I could rely on him/her to mail an important letter for me if I couldn't get to the post office. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 53. If I had to catch an airplane, I could not be sure (s)he would get me to the airport on time. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 54. I could expect him/her to tell me the truth. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 55. (S)he would never intentionally misrepresent my point of view to others. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 56. If I told him/her what things I worry about, (s)he would not think my concerns were silly. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

ID: _____ J

| | Strongly Disagree | | | Neutral | | | Strongly Agree |
|--|------------------------------|---|---|----------------|---|---|---------------------------|
| 57. If (s)he didn't think I handled a certain situation very well, (s)he would not criticize me in front of other people. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 58. If my alarm clock was broken and I asked him/her to call me at a certain time, I could count on receiving the call. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 59. The other consultant is likely to take advantage of me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 60. I would expect him/her to play fair. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 61. I wouldn't want to buy a piece of used furniture from him/her because I wouldn't believe him/her estimate of its worth. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 62. If (s)he couldn't get together with me as I planned, I would believe him/her excuse that something important had come up. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 63. If (s)he knew what kinds of things hurt my feelings, I would never worry that (s)he would use them against me, even if our relationship changed. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 64. If (s)he gave me a compliment, I would question if (s)he really meant what was said. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

65. Please circle the picture below which best describes your relationship with the other consultant:



Appendix 8

Experiment 1 Variables and Questionnaire Items

The items below are drawn from the pre- and post-experiment questionnaires, and are grouped by the variable that they address. Because the questionnaires included items that were not used in the analysis (e.g. distraction questions), only those items that correspond to a specific variable are listed. Bracketed text indicates different wordings for the [Critic / Writer].

Self-efficacy

- I can always manage to solve difficult problems if I try hard enough.
- If someone opposes me, I can find the means and ways to get what I want.
- It is easy for me to stick to my aims and accomplish my goals.
- I am confident that I could deal efficiently with unexpected events.
- Thanks to my resourcefulness, I know how to handle unforeseen situations.
- I can solve most problems if I invest the necessary effort.
- I can remain calm when facing difficulties because I can rely on my coping abilities.
- When I am confronted with a problem, I can usually find several solutions.
- If I am in trouble, I can usually think of a solution.
- I can usually handle whatever comes my way.

Negativity

- The feedback I [gave / received] was positive.
- The feedback I [gave / received] suggested that the PowerPoint presentation needs a lot of improvement.
- [I / The other consultant] thought [the other consultant / I] did a good job.

Threat Regulation

- The feedback I [gave/received] was polite.
- [I / The other consultant] tried to protect [the other consultant's / my] feelings.
- The feedback I gave was more positive than the other consultant deserved. / The other consultant gave more positive feedback than (s)he thought I deserved.
- [I / The other consultant] held back some comments to protect [the other consultant's / my] feelings.
- [I / The other consultant] could imagine how [the other consultant / I] was feeling.
- The feedback I [gave / received] was completely truthful.

Shared Understanding

- The problem with Max is easy to solve.
- The problem described in the case is realistic.
- I believe we will get the full bonus for the quality of the PowerPoint presentation.
- The first draft of the PowerPoint presentation was as good as it could have been.
- The other consultant and I make a good team.
- The other consultant and I share many interests.
- Please circle the picture below which best describes your relationship with the other consultant: (overlapping circles diagrams)
- I am confident that I know what the other consultant thinks of me.
- The other consultant understands how I was thinking.
- The other consultant and I agreed about the goals of the exercise.
- The other consultant and I are more similar than we are different.
- I have the other consultant's best interests at heart. / The other consultant has my best interests at heart.

- The feedback I gave was positive. / The feedback I received was positive.
- The feedback I gave suggested that the PowerPoint presentation needs a lot of improvement. / The feedback I received suggested that the PowerPoint presentation needs a lot of improvement.
- I thought the other consultant did a good job. / The other consultant thought I did a good job.
- The feedback I gave was polite. / The feedback I received was polite.
- I tried to protect the other consultant's feelings. / The other consultant tried to protect my feelings.
- The feedback I gave was more positive than the other consultant deserved. / The other consultant gave more positive feedback than (s)he thought I deserved.
- I held back some comments to protect the other consultant's feelings. / The other consultant held back some comments to protect my feelings.
- I could imagine how the other consultant was feeling. / The other consultant could imagine how I was feeling.
- The feedback I gave was completely truthful. / The feedback I received was completely truthful.

Conditions of Trust Inventory

- The other consultant always tells me the truth.
- The other consultant treats me fairly.
- I can count on the other consultant to be trustworthy.
- I trust the other consultant.
- The other consultant deals honestly with me.
- The other consultant is likely to take advantage of me.
- The other consultant keeps information from me.
- The other consultant shares his/her thoughts with me.
- The other consultant tells me what he/she is thinking.
- The other consultant tells me what's on his/her mind.
- The other consultant would not lie to me.

Specific Interpersonal Trust Scale

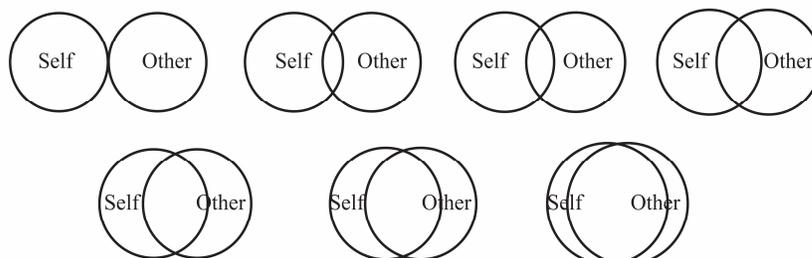
- (S)he would never intentionally misrepresent my point of view to others.
- I could expect him/her to tell me the truth.

- I could rely on him/her to mail an important letter for me if I couldn't get to the post office.
- I could talk freely to him/her and know that (s)he would want to listen.
- I would be able to confide in him/her and know that (s)he would want to listen.
- I would expect him/her to play fair.
- I would go hiking with him/her in unfamiliar territory if (s)he assured me (s)he knew the area.
- I wouldn't want to buy a piece of used furniture from him/her because I wouldn't believe him/her estimate of its worth.
- If (s)he couldn't get together with me as I planned, I would believe him/her excuse that something important had come up.
- If (s)he didn't think I handled a certain situation very well, (s)he would not criticize me in front of other people.
- If (s)he gave me a compliment, I would question if (s)he really meant what was said.
- If (s)he knew what kinds of things hurt my feelings, I would never worry that (s)he would use them against me, even if our relationship changed.
- If (s)he promised to do me a favor (s)he would follow through.
- If (s)he unexpectedly laughed at something I did or said, I would wonder if (s)he was being critical and unkind.
- If (s)he were going to give me a ride somewhere and didn't arrive on time, I would guess that there was a good reason for the delay.
- If I had to catch an airplane, I could not be sure (s)he would get me to the airport on time.
- If I told him/her what things I worry about, (s)he would not think my concerns were silly.
- If my alarm clock was broken and I asked him/her to call me at a certain time, I could count on receiving the call.
- If we decided to meet somewhere for lunch, I would be certain (s)he would be there.

Mutuality

- The other consultant and I make a good team.
- The other consultant and I share many interests.
- The other consultant understands how I was thinking.

- The other consultant and I agreed about the goals of the exercise.
- The other consultant and I are more similar than we are different.
- Please circle the picture below which best describes your relationship with the other consultant:



Feedback Acceptance

- It is hard to take the comments that I was given seriously.
- I found the feedback I received to be useful
- I believe the feedback I received.
- I incorporated all the other consultant's suggestions into my PowerPoint presentation.
- I do not agree with the feedback provided by the other consultant
- The feedback I received was completely truthful

Motivation

- The other consultant motivated me to do my best work.

Satisfaction

- I am satisfied with the feedback I [gave / received].
- Overall, [giving / receiving] feedback was a satisfying experience.

Appendix 9

Experiment 1 Transcript Coding Instructions

These are the final version of the instructions used to code the feedback transcripts from the first experiment. After segmenting the transcripts, coders used these instructions to identify the characteristics of each segment. The coders practiced with these instructions on transcripts from pilot sessions. Some changes were made to the instructions and coding schemes based on the experience with the pilot transcripts. Crossed-out sections indicate codes that were dropped after pilot testing; cross-outs were left in the instructions for coders' reference.

Coding Instructions

Version 5

For all coding, write in a proposition number or circle the appropriate answer. If issues arise, make notes on the back of the coding sheet. Additionally, if anything is classified as “Other,” please make a note as to the reason on the back of the coding sheet.

The first four items should be filled out for all propositions. The others should be filled out only for propositions of “Feedback” type.

| | | |
|------------------|----------------------------|--|
| All Propositions | Prop# | Proposition number (actually, the letter to the left of each proposition bracket) |
| | Resegment (Reseg) | If you think that this proposition needs to be resegmented (that we don't have the right text grouped together), then put in a check mark. Even if you check this box, complete the rest of the coding as if the segmenting were correct. |
| | Continuation (Cont) | <p>If this proposition is a continuation of another proposition, insert the Prop# of the proposition it continues. Typically, this would be after an interruption or due to overlapping utterances, but not lots of other items in between. The idea here is that if it wouldn't have been for the unrelated proposition B, propositions A and C would probably have been grouped together. If there are fewer than 2 lines between two related propositions, it is probably a continuation rather than a repeat. A continuation is essentially the same as if we would have drawn connecting lines between the segments. Continuation suggests that we are still on the same topic, rather than returning to a topic at a later point.</p> <p>If there is a continuation, treat all of the pieces of the continuation as a single utterance, and only fully code the first proposition in the series. In other words, if you see something like this (each line is a separate proposition):</p> <ol style="list-style-type: none"> 1. J: You should do X. 2. J: You should do Y. 3. W: Ah, yes, X. I agree. 4. W: Y? Are you sure? I don't like that. <p>Code line 3 as a continuation of 1, line 4 as a continuation of 2, and then code line 1 as feedback with discussion and agreement and line 2 as feedback with discussion and challenge. Even if there are several continuing pieces, code them all as part of the first in the series.</p> |
| | Repeat | If this is a repeated mention of an idea or piece of feedback from earlier in the conversation, enter the Prop# of the <i>first</i> mention. |

Coding Instructions

Version 5

| | | | |
|-------------------------|-----------------|---|--|
| All Propositions | Type | C | Conversation management (e.g. Let's move on to the next point, We should start, We're out of time, etc.) or social exchange (greetings, non-topical chat, thanks) |
| | | S | Social exchange (greetings, non-topical chat, thanks) [Combined with C] |
| | | T | Technology or experiment comment (e.g. about videoconferencing, time limits, bonuses). Note: for time limits, if it is a discussion of time (e.g. "How much time will we have to do this?") it goes here. If it is a "We're almost out of time" or "Time's Up" comment, it should be coded as conversation management. |
| | | F | Feedback about the presentation – Note: Choose this category if there is any feedback at all, or it's a "mixed" situation (e.g. both feedback and conversation management together). Also includes general conversation about the case that may not have a direct implication (which will be marked as "Neutral"). This also includes general deflection or agreement propositions (e.g. the writer says "I didn't have enough time to do everything" but not in response to a specific comment). Again – mark these as Neutral, but include that there is a deflection. |
| | | N | Nonsense or non-meaningful statements. "Ummm"; "Anyway, uh, I guess..." etc. |
| | | G | General conversation about the case that does not include feedback [Combined with F] |
| | | O | Other (please describe on back of worksheet) |
| Feedback Only | Category | C | Content of recommendations (about the case and the response to it, not about the presentation itself) |
| | | A | Arrangement of ideas/bullets, amount of content (e.g. move a bullet to another page, add more bullets, who the presentation is addressed to), word choice and rephrasing (without a content change) |
| | | M | Mechanics (grammar / punctuation / spelling) |
| | | F | Formatting (colors, backgrounds, clip art, font, bold/italic, capitalization, etc.) |
| | | O | Other (describe on back of worksheet) |

Coding Instructions

Version 5

| | | | | | | | | | | |
|--------------------------|--|---|---|------------------|---|---|---|---|---|--|
| Feedback Only | Implication (Impl) | This refers to what the feedback is suggesting should be done. Unless the segment has only the Writer speaking, it refers to what the Judge is suggesting. | | | | | | | | |
| | | <table border="1"> <tr> <td>C</td> <td>Change something</td> </tr> <tr> <td>K</td> <td>Keep something, or a compliment (e.g. "This is good" or "Overall I like the presentation.")</td> </tr> <tr> <td>N</td> <td>Neutral (mention of something without clear recommendation to change or keep). This also includes general comments about the case that may not have a clear "do this" or "keep this" implication.</td> </tr> <tr> <td>M</td> <td>Mixed (e.g. "You could change it or keep it the way you have it.")</td> </tr> </table> | C | Change something | K | Keep something, or a compliment (e.g. "This is good" or "Overall I like the presentation.") | N | Neutral (mention of something without clear recommendation to change or keep). This also includes general comments about the case that may not have a clear "do this" or "keep this" implication. | M | Mixed (e.g. "You could change it or keep it the way you have it.") |
| | C | Change something | | | | | | | | |
| | K | Keep something, or a compliment (e.g. "This is good" or "Overall I like the presentation.") | | | | | | | | |
| | N | Neutral (mention of something without clear recommendation to change or keep). This also includes general comments about the case that may not have a clear "do this" or "keep this" implication. | | | | | | | | |
| M | Mixed (e.g. "You could change it or keep it the way you have it.") | | | | | | | | | |
| Rationale (Rat) | Does either the judge or writer provide a rationale for why a change should be made or why something should be kept? Basically this includes anything that might answer the "Why" question. This can be as simple as, "It will be prettier if..." or "The instructions say..." | | | | | | | | | |
| Discussed (Disc) | Is there discussion of this point? Note: Discussion implies more than a simple "OK." | | | | | | | | | |
| Challenged (Chal) | Is the comment challenged by the non-initiating person? This implies more than a clarification or suggestion of alternate wording, but actually saying "I don't agree" or "I don't like that" or "I'm not sure about that (with overtones of disagreement)." | | | | | | | | | |
| Agreement (Agree) | Does the non-initiating person (e.g. if W comments on something, then this category is about J) explicitly express agreement with the other person? This includes cases where someone just says "OK" or "Yes," but not cases in which they use an ambiguous signal like "Uh-huh" or "Mmm-hmmm." It is possible to have both a Challenge and Agreement (for example, I disagree at first, but then agree in the end). | | | | | | | | | |

Coding Instructions

Version 5

Feedback Only

Softened (Soft)

Is the feedback phrased in such a way to make it less forceful or easier to take? For example, does the judge say, "I like the way you do x, but you could make it clearer." Or "Some people might like it better if you did it like X." This can also include cases where the Judge begins the feedback as a question instead of a statement ("Do you think the background needs to be more colorful?"). This also includes any time the person giving feedback says, "Maybe you could..." or something else to suggest that accepting the feedback would be optional.

Deflected (Defl)

Does the writer give an excuse or do anything to distance themselves from a criticism? In other words, they might say something like, "I didn't have enough time to do that" or "I didn't like that either, but I couldn't think of a better word."

Initiator (Init)

Did the writer or the judge initiate this topic? Note: Saying "Do you have any other comments" is not an initiation. I want to know who first decided that this was something that needed to be paid attention to.

Appendix 10

Experiment 1 Acceptance Coding Instructions

These are the instructions that coders used to code feedback acceptance. Even after significant pilot testing and training, coders were unable to reach an acceptable level of agreement, and data from this coding was not used.

Feedback Acceptance Coding Instructions v.2

Feedback acceptance is basically a measure of whether or not someone followed the feedback they were given or whether they ignored it. In this experiment, one subject created a PPT presentation about the business case study. Another subject then gave feedback to the first subject about how to make the PPT presentation better. Finally, the first subject was given a chance to edit the PPT presentation based on the feedback they were given.

This coding compares the PPT presentation from before getting feedback to the PPT presentation after feedback. The feedback conversation has been divided into “items of feedback.” Each item of feedback is a section of the conversation that makes a single recommendation. The item of feedback may include discussion between the two subjects, or it could be just one subject talking.

Materials you will have for each session:

- Transcript of the feedback conversation, with units of feedback marked and numbered
- A spreadsheet with a list of the items of feedback, in the order that they should be coded (1 spreadsheet includes all session). The spreadsheet also shows the “implication” for the item of feedback: “C” for feedback that suggests that something should be changed, and “K” for feedback that suggests that something should be kept as it is.
- 2 PPT presentations, marked “before” and “after.”

For each session, open both PPT presentations so that comparisons can be made. I find it easiest to view them side-by-side using the “Arrange All” command under the “Window” menu in PPT. Then, go through each item of feedback and code it on the following categories:

Followed: Was the advice followed when the PPT presentation was edited? Use these codes:

- **Y:** The feedback was followed. If the feedback suggested a change, the change was made. If the feedback suggested keeping something, it was kept. Note: to mark “Y” the specific feedback must be followed. For example, if the Critic says, “Move the bullet on slide 2 to slide 3,” but the Writer moves the bullet to slide 4, this is a “N.” However, if the Critic had only said, “Move the bullet off of slide 2” then the Writer’s actions would be a “Y.” This applies at the level of words as well. If the Critic asks for a rephrasing and gives a very specific new phrasing, then it must be exact. However, if the Critic says, “Change it to something like xxxxx” then there is leeway for the Writer.
- **N:** The feedback was not followed.

- **F:** Lack of clarity in the feedback. It's not possible to judge whether or not the feedback was followed because you can't figure out what the feedback is suggesting.
- **P:** Lack of clarity in the PPT. It's not possible to judge whether or not the feedback was followed even though the feedback is clear, because it's not clear how changes were made to the PPT presentation.

Repeat: Sometimes subjects will repeat their feedback, or summarize it later in the conversation. However, even though the subjects talk about it twice, there is really only one change to be made. If this item of feedback is a repetition of an earlier item of feedback, do not fill out the Followed column, and instead put a "1" in the Repeat column.

Badcode: Do you think that this item was coded improperly? For example, is it chit-chats or greetings rather than about the PPT presentation? Does it include more than one item of feedback in the same segment? Does the implication say "Keep" when it's really "Change?" If yes, put a "1" in this BadCode column.

Some notes and tips:

- Not every line of the transcript will be coded here. We will only be focusing on those sections that have already been identified as part of the feedback. It is OK to use the context of other statements to help figure out what a particular item of feedback refers to, but we are only coding those segments that are indicated in the spreadsheet.
- One of the difficult things to figure out is that the person giving feedback may "take back" their feedback after it's given. In other words, they might at first say, "You should change X," but then after chatting about it, they then say, "Well, I guess it's OK as it is." Here are some tips for dealing with this:
 - If the critic clearly changes their mind, and says something like, "Actually, don't change that." or "Forget I said that," then assume that the feedback is nullified. This will probably result in an "F" in the Followed column unless there is a different change/keep mentioned in the item of feedback.
 - If the critic seems to draw back slightly, and says something like, "I guess it would work if you kept it as it is," or "It's up to you, though, you don't have to follow my advice," consider the feedback as it was before they drew back. The underlying idea here is that if someone says this, it's more likely that they are just trying to be polite, not that they really believe that the change shouldn't be made. This should result in a Y, N, or P in the Followed column.
- You may notice that the before and after PPT presentations have different author names. This was done simply to anonymize the presentations. The before and after PPTs were written by the same person.

Appendix 11

Experiment 1 PowerPoint Grading Instructions

Grading Instructions

First, read through the Subject Instructions, the HBR Case Study “Do Something—He’s About to Snap,” and the expert commentaries on the case.

Open the Excel file to record your grading.

Please grade the PowerPoint presentations in the order listed in the Excel file.

For each PowerPoint presentation, open the file on your computer, and go through the file at least once in “presentation” mode. This will allow you to see if there are transitions or effects in the slides. Feel free to go back through the PPT presentation as much as you want as you grade it.

For each presentation, fill out the appropriate row in the Excel file. Each of the following questions corresponds to one column in the Excel file. Unless otherwise indicated, place a “1” in the appropriate box if the answer to the question is Yes. Place a “0” (zero) in the column if the answer is No.

For any “overall score” questions, please answer with your general reaction. This is a subjective rating. Also, this can include other factors beyond what are asked about specifically here, so it does not necessarily need to correspond to how you answered the other questions. In addition, the final “overall” score does not need to be an average of the other overall scores.

Structure

1. Does the first slide have a title for the presentation?
2. Does the first slide have the client’s name (Gene Kozlowski or MMI)?
3. Does the first slide have the consultant’s (subject’s) name?
4. Are there exactly four slides?
5. Does each slide (other than the title slide) present a single recommendation or closely related set of recommendations? In other words, is each slide a single coherent idea?
 - No: 0
 - Somewhat: 1
 - Yes: 2
6. Does each slide (ignore the title slide) have at least 3 and no more than 10 bullet points?

Content

7. Does the presentation focus only on Max? (In other words, does it consider Max as the only problem, or does it also recognize problems with the other workers?)

8. Does the presentation focus only on the other members of the department? (In other words, does it suggest that Max's behavior isn't a problem and the other workers are just overreacting?)
9. Does the presentation recommend firing or transferring Max immediately? (This does not include firing "as a last resort" or "if other recommendations fail.")
10. Does the presentation recommend documenting problems and/or gathering evidence?
11. Does the presentation suggest social events or other positive means to encourage teamwork, socializing, and respect?
12. Does the presentation suggest punishing Max for his behavior?
13. Does the presentation suggest counseling or training programs for Max or other members of the department?
14. Does the presentation specifically mention that Max's behavior or the co-workers' reactions are having an effect on productivity and/or job performance?
15. Does the presentation suggest conversations, workshops, or other feedback mechanisms?
16. Does the presentation mention MMI's policies and procedures?
17. Does the presentation mention legal considerations?
18. Are the recommendations consistent with the approaches recommended in the commentaries?
 - No: 0
 - Some yes, some no: 1
 - Yes: 2
19. What overall score would you give this presentation for the content of the recommendations? (1: Worst – 10: Best)

Rhetoric

20. Do the recommendations seem practical? (In other words, is this something that the managers or MMI could do? Will the employees go along with them?)
 - Very impractical: 1
 - Somewhat impractical: 2
 - Neutral: 3
 - Somewhat practical: 4
 - Very practical: 5
21. Are the recommendations relevant to the problem in the case?
 - Very irrelevant: 1
 - Somewhat irrelevant: 2
 - Neutral: 3
 - Somewhat relevant: 4
 - Very relevant: 5

22. In general, are the recommendations specific?
- Very vague: 1
 - Somewhat vague: 2
 - Neutral: 3
 - Somewhat specific: 4
 - Very specific: 5
23. Are the recommendations well justified? (In other words, does the author provide good reasons why each recommended action should be followed?)
- Very unjustified: 1
 - Somewhat unjustified: 2
 - Neutral: 3
 - Somewhat justified: 4
 - Very justified: 5
24. Do the recommendations create obvious new problems?
- No new problems: 0
 - Some minor problems: 1
 - Many new problems: 2
25. Are you convinced by the presentation?
- Not at all convinced: 0
 - Somewhat convinced: 1
 - Very convinced: 2
26. Is the writing clear?
- No: 0
 - Somewhat: 1
 - Yes: 2
27. Is the writing concise?
- No: 0
 - Somewhat: 1
 - Yes: 2
28. What overall score would you give this presentation for the writing and rhetoric?
(1: Worst – 10: Best)

Format and Mechanics

29. Does the presentation use a background image, color or theme (including special colors for text headings, special bullets, etc.)?
30. Does the text color blend into the background (making it hard to read)?
31. Does the presentation use transitions or other animation effects?
- No: 0
 - Yes, but they harm the overall presentation: 1
 - Yes, but they do not help or hurt the presentation: 2
 - Yes, and they help the overall presentation: 3

32. Does the presentation use pictures (other than background images)?
- No: 0
 - Yes, but they harm the overall presentation: 1
 - Yes, but they do not help or hurt the presentation: 2
 - Yes, and they help the overall presentation: 3
33. Is the text ever less than “18 pt” size?
34. Is the text ever too crowded or does it ever run off any of the slides? That is, does all of the text always fit well on the screen?
35. Is there too much blank space on any of the slides (do not consider the title slide)?
36. Is the punctuation consistent throughout the presentation? (e.g. the use of periods at the end of bullets)
37. Are there spelling errors?
- None: 0
 - One or two: 1
 - More than two: 2
38. Are there grammar errors? (Note – this does not include fragmented sentences.)
- None: 0
 - One or two: 1
 - More than two: 2
39. What overall score would you give this presentation for format and mechanics?
(1: Worst – 10: Best)

Overall

40. What overall score (1-100) would you give this presentation?

Appendix 12

Experiment 2 Protocol Summary

Session 1

| Approx. Timing | Event |
|-------------------|--|
| 0:00 | Group of subjects arrive. Each is seated at his own computer around a table |
| 0:01 | Consent |
| 0:03 | Administer pre-questionnaires (Appendix 16) |
| 0:06 | Collect questionnaires; Hand out case study and Session 1 instructions (Appendix 10) |
| As writers finish | Save document; Confirm Session 2 time and give reminder form |

Session 2 (next day)

| Approx. Timing | Event |
|--|---|
| 0:00 | Individual subject arrives. Seated at individual computer in cubicle |
| 0:01 | Review consent form and ask to verbally reconfirm consent |
| 0:03 | Give Writer printed copy of his essay, and ask him to read it |
| 0:10 | Administer pre-feedback questionnaire (Appendix 17) |
| 0:12 | Collect questionnaire and give Session 2 Part 1 instructions (Appendix 14) |
| 0:15 | Take Writer to communication room (communication media already prepared); Connect to confederate Critic (at another location); |
| When confederate Critic signals to experimenter that all feedback has been delivered (about 5 minutes) | Disconnect communication media; Take Writer back to cubicle; Open document in Microsoft Word on computer, and give Session 2 Part 2 instructions (Appendix 15). |
| When Writer finishes editing | Save edited document; Administer post-experiment questionnaire (Appendix 18) |
| when Writer finishes questionnaire | Collect questionnaire; Debrief; pay and dismiss Writer |

Appendix 13

Experiment 2 Session 1 Instructions

Instructions – Part 1

We will ask you to pretend that are taking a class in a business school. You will be given information about a problem that is happening at a fictitious company called MMI. After you have read the information, you will be asked to write an essay that explains what you think the managers of MMI should do.

In your essay, you should begin by summarizing the problem as you understand it. This summary should specifically mention who you think is at fault, and to what degree.

The rest of your essay should go through all of the options available to MMI. For each option, be sure to explain whether you think it is something that the managers at MMI should or should not do, and why.

Your essay will be graded for content (5 pts) and quality of writing (5 pts). You may receive a bonus depending on your total score:

| Score | Bonus |
|-------|-------|
| 10 | \$5 |
| 9 | \$4 |
| 8 | \$3 |
| 7 | \$2 |
| 6 | \$1 |
| 0-5 | \$0 |

You should use Microsoft Word to write your essay. After you have completed writing, save your essay to the “My Documents” folder on your computer, with the filename

Let the experimenter know you are finished, and you will be given further instructions.

Please do not discuss this or any other aspect of this study with other participants unless directed to do so by the experimenter.

You will have up to an hour to complete the essay, although most people finish in about 30 minutes.

Appendix 14

Experiment 2 Session 2 Pre-Feedback Instructions

Instructions – Session 2 – Part 1

In this session, you will revisit the essay that you wrote in the first session. You have already had a chance to read through the essay and answer some questions about it.

Now you will be paired with another study participant who has had a chance to read your essay. That person will be giving you feedback about how they think you could improve your essay.

After you talk to the other participant, you will be given a chance to make any changes to your essay that you want. Feel free to take notes while talking to the other participant—you will be able to use them when you edit your essay.

Remember—the final version of your essay will be graded for content (5 pts) and quality of writing (5 pts). You may receive a bonus depending on your total score:

| Score | Bonus |
|-------|-------|
| 10 | \$5 |
| 9 | \$4 |
| 8 | \$3 |
| 7 | \$2 |
| 6 | \$1 |
| 0-5 | \$0 |

Please do not discuss this or any other aspect of this study with other participants except as directed by the experimenter.

The experimenter will now give you further instructions.

Appendix 15

Experiment 2 Session 2 Post-Feedback Instructions

Instructions – Session 2 – Part 2

You can now make any changes to your essay that you want. As you edit your essay, feel free to use any notes you took from your discussion.

You will find your essay on the desktop of your computer. The filename is:

Double-click on the file to open it, and save your changes to the same file. When you have finished, please wait at your computer. The experimenter will check back periodically to check on your progress.

You will have up to 30 minutes to edit the document.

Remember—the final version of your essay will be graded for content (5 pts) and quality of writing (5 pts). You may receive a bonus depending on your total score:

| Score | Bonus |
|-------|-------|
| 10 | \$5 |
| 9 | \$4 |
| 8 | \$3 |
| 7 | \$2 |
| 6 | \$1 |
| 0-5 | \$0 |

Please do not discuss this or any other aspect of this study with other participants.

You may begin editing as soon as you are ready.

Appendix 16

Experiment 2 Session 1 Pre-Experiment Questionnaire

Participant ID: _____

Pre-Experiment Questionnaire

What year were you born? _____

In what country were you born? USA Other: _____

Have you lived in the United States for your whole life (except for vacations or other short absences)?

- Yes
- I moved here less than 3 years ago
- I moved here between 3 and 10 years ago
- I moved here more than 10 years ago

What other countries have you lived in? (for at least 6 months)

Is English your first language?

- Yes
- No. My first language is: _____

What is the highest academic degree you have received?

- Less than high school diploma
- High school diploma or equivalent
- Undergraduate degree (for example, B.A., B.S., etc.)
- Graduate degree (Masters or Doctorate)

What was your field/major? _____

What is your current occupation? _____

--- continued on next page ---

Participant ID: _____

What is your race or ethnic origin?

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic or Latino
- Native Hawaiian or Pacific Islander
- White
- Other ethnic or racial category: _____

Please indicate how often you use each of the following:

| | Every Day | At least once a week | At least once a month | Less than once a month | Never |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Word Processor | <input type="checkbox"/> |
| Spreadsheet | <input type="checkbox"/> |
| E-mail | <input type="checkbox"/> |
| Microsoft PowerPoint | <input type="checkbox"/> |
| Web pages | <input type="checkbox"/> |
| Instant Messaging | <input type="checkbox"/> |
| Telephone | <input type="checkbox"/> |
| Web cams | <input type="checkbox"/> |
| Video conferencing | <input type="checkbox"/> |
| Chat rooms | <input type="checkbox"/> |
| Online Stores (e.g. Amazon.com) | <input type="checkbox"/> |
| Online auctions (e.g. eBay) | <input type="checkbox"/> |
| Microsoft Windows computers | <input type="checkbox"/> |
| Apple Macintosh computers | <input type="checkbox"/> |
| Unix/Linux-based computers | <input type="checkbox"/> |

Appendix 17

Experiment 2 Session 2 Pre-Feedback Questionnaire

ID: _____

Session 2 – Questionnaire 1

Now that you have re-read your essay, please complete this questionnaire.

Please indicate how strongly you agree or disagree with the following statements by circling the appropriate number for each question below.

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Slightly Disagree
- 4 = Neutral
- 5 = Slightly Agree
- 6 = Agree
- 7 = Strongly Agree

| | Strongly Disagree | | Neutral | | | Strongly Agree | |
|--|-------------------|---|---------|---|---|----------------|---|
| 1. I am happy with my essay. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The essay is as good as it could be. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I have changed my mind about the recommendations I made in the essay. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. My recommendations will solve the problems at MMI. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

5. Remember that you will be given a bonus based on the quality of your essay (see the chart at the right). How much of a bonus do you think you will receive? Please circle your answer:

\$0 \$1 \$2 \$3 \$4 \$5

| Score | Bonus |
|-------|-------|
| 10 | \$5 |
| 9 | \$4 |
| 8 | \$3 |
| 7 | \$2 |
| 6 | \$1 |
| 0-5 | \$0 |

6. If you were able to edit the essay before submitting it, how much time would you spend working on it?

_____ minutes

Appendix 18

Experiment 2 Session 2 Post-Experiment Questionnaire

ID: _____

Follow Up Questionnaire

As a final step, please complete this questionnaire. Your answers will remain confidential and will not be shared with the other participant.

Section 1

Please indicate how strongly you agree or disagree with the following statements by circling the appropriate number for each question below.

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Slightly Disagree
- 4 = Neutral
- 5 = Slightly Agree
- 6 = Agree
- 7 = Strongly Agree

| | Strongly Disagree | | Neutral | | | Strongly Agree | |
|--|-------------------|---|---------|---|---|----------------|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1. The problem with Max is easy to solve. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. The other participant understood the problems at MMI. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. The problem described in the case is realistic. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. The first draft of my essay was as good as it could have been. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. I incorporated all the other participant's suggestions into my essay. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. I was satisfied with Microsoft Word. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. The other participant shares his/her thoughts with me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. I found it easy to pick out the important details from the MMI situation. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. I am typically a very persuasive person. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. I found it difficult to communicate with the other participant. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

ID: _____

| | Strongly Disagree | | Neutral | | | Strongly Agree | |
|---|--------------------------|---|----------------|---|---|-----------------------|---|
| 11. The feedback I received suggested that my essay needed a lot of improvement. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. People often tell me that I am argumentative. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. The feedback I received was completely truthful. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. The other participant is qualified to provide advice for this task. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. The other participant is trustworthy. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. The other participant and I agreed about the goals of the exercise. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. I think I could have been more persuasive giving an oral presentation rather than writing an essay. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. The other participant understood what I was thinking. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. I am confident that I know what the other participant thinks of me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. I am satisfied with the feedback I received. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | Strongly Disagree | | Neutral | | | Strongly Agree | |
|--|--------------------------|---|----------------|---|---|-----------------------|---|
| 21. I do not agree with the feedback provided by the other participant. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. The other participant gave more positive feedback than (s)he thought I deserved. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. I trust the other participant. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. The feedback I received was polite. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. Using Microsoft Word is easy for me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 26. The other participant has my best interests at heart. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 27. I found the feedback I received to be useful. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 28. The other participant and I are more similar than we are different. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 29. The other participant motivated me to do my best work. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 30. The other participant held back some comments to protect my feelings. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

ID: _____

| | Strongly Disagree | | Neutral | | | Strongly Agree | |
|---|--------------------------|---|----------------|---|---|-----------------------|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 31. It is hard to take the comments that I was given seriously. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 32. The other participant thought I did a good job. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 33. The other participant tried to protect my feelings. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 34. The feedback I received was positive. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 35. The feedback I received was skillfully communicated. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

36. Remember that you will be given a bonus based on the quality of your essay (see the chart at the right). How much of a bonus do you think you will receive? Please circle your answer:

\$0 \$1 \$2 \$3 \$4 \$5

| Score | Bonus |
|-------|-------|
| 10 | \$5 |
| 9 | \$4 |
| 8 | \$3 |
| 7 | \$2 |
| 6 | \$1 |
| 0-5 | \$0 |

Appendix 19

Experiment 2 Variables and Questionnaire Items

The items below are drawn from the pre-, mid-, and post-experiment questionnaires, and are grouped by the variable that they address. Because the questionnaires included items that were not used in the analysis (e.g. distraction questions), only those items that correspond to a specific variable are listed. Bracketed text indicates different wordings for the [Critic / Writer].

Task-Specific Efficacy

- I am happy with my essay.
- The essay is as good as it could be.
- I have changed my mind about the recommendations I made in the essay.
- My recommendations will solve the problems at MMI.
- Remember that you will be given a bonus based on the quality of your essay (see the chart at the right). How much of a bonus do you think you will receive? Please circle your answer.
- If you were able to edit the essay before submitting it, how much time would you spend working on it? _____ minutes

Negativity

- The feedback I received suggested that my essay needed a lot of improvement.
- The other participant thought I did a good job.
- The feedback I received was positive.

Threat Regulation

- The feedback I received was polite.
- The other participant held back some comments to protect my feelings.
- The other participant gave more positive feedback than (s)he thought I deserved.
- The other participant tried to protect my feelings.

Trust

- The other participant shares his/her thoughts with me.
- The other participant is trustworthy.
- I trust the other participant.
- The other participant has my best interests at heart.
- The feedback I received was completely truthful.

Expertise

- The other participant understood the problems at MMI.
- The other participant is qualified to provide advice for this task.

Mutuality

- The other participant and I agreed about the goals of the exercise.
- The other participant understood what I was thinking.
- I am confident that I know what the other participant thinks of me.
- The other participant and I are more similar than we are different.

Feedback Acceptance

- I incorporated all the other participant's suggestions into my essay.
- I am satisfied with the feedback I received.
- I do not agree with the feedback provided by the other participant.
- I found the feedback I received to be useful.
- The other participant motivated me to do my best work.
- It is hard to take the comments that I was given seriously.

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